



International Conference of  
Students of Systematic Musicology

17–19 September, 2015  
University of Leipzig

In cooperation with SEMPRES

*sempre:*

Society for Education, Music  
and Psychology Research



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A special thanks to the local support of Stefan Hindtsche, Mathias Schwarz, Anne-Marlen Gaus, Michael Plewinski, Alexander C. Faschon, Thierry Gelloz, Kim Grote, João Romão, and the student representatives of the Institute for Musicology at the University of Leipzig!

The SEMPRE travel awards recipients are: Diana Kayser, Eva Matlschweiger, Flemming Kristensen, George Waddell, Gina Emerson, Liubou Pazniakova, Manuel Anglada Tort, Marco Bussi, Raquel Rohr, Sabrina Sattmann, Sarah Sauvé, Vera Fonte, and Yuri Behr Kimizuka.

Dear SysMus participants,

Welcome to the city of Leipzig! Apart from the world-known musical traditions, Leipzig and its university have been a hotspot of dedicated systematic research. An off-spring of the exploration of nature and natural history, music served as a key to penetrate and indeed to unfold the *mundus combinatus*. Gottfried Wilhelm Leibniz, a law student at this University, pondered the combinatoric nature of musical structures and noticed that music processing involves an unconscious calculating of the soul ("*Musica est exercitium arithmeticae occultum nescientis se numerare animi*"). Leibniz seems to anticipate modern perception theories here. He is the author of *Dissertatio DE ARTE COMBINATORIA* (1666) in which he sought to establish combinatorics as a *scientia universalis*. In this *scientia*, *musica* assumes a key role, confirming the impact of *musica* on early modern knowledge cultures and research procedures.

Lorenz Mizler established his thriving journal in Leipzig ("Neu eröffnete Musikalische Bibliothek"). The inaugural issue features an aid to compose the *Generalbass*. It is a device in the form of a so-called paper machine consisting of rotating circles. Mizler situates his machine against the background of artificial and natural logic: while art imitates nature, the course of natural logic should also provide a model for the artistic realm. In the 19<sup>th</sup> century, the founder of experimental psychology, Wilhelm Wundt, ventured into the area of time perception, paving the way for theories of subjective rhythmic grouping. Hugo Riemann who founded the *collegium musicum* out of which the current institute evolved, should be regarded as a key systematic researcher. He voiced the idea that listeners complete the intentions of composers through an active synthesis and rehearsal of their tonal imaginations (*Tonvorstellungen*).

Systematic concerns played an important role way through the 20<sup>th</sup> century, with Heinrich Bessler establishing important concepts of music sociology (*Darbietungsmusik* versus *Umgangsmusik*). In the 1990s, the systematic chair put particular emphasis on historical aesthetics and on the theory of social systems.

Over the last decade, systematic research at the Leipzig chair turned to the emerging topics of actor-network-theories, to theories of musical mediation and of discursive networks. In the absence of an experimental infrastructure, conceptual issues, philosophically informed systematic enquiries, and field-work on trans-cultural musical identities in the metropolis (Berlin, Chicago, Kolkata) became paramount. Following post-functionalist and ecological approaches to music perception and interaction, a co-operation with the junior research groups led by Stefan Koelsch and Peter Keller at Max Planck Institute for Human Cognitive and Brain Sciences (CBS) has sparked lively discussions of culturalistic & empirical studies of music and their respective research ideologies.

Ph.D. candidates in Systematic Musicology come from 7 countries and cover topics from Charisma in Karajan's TV studio recordings, Sinti and Roma and their musical cultures within Germany's majority culture, to the avant-garde networks spanning around Lisbon's Gulbenkian Foundation in the 1970s.

Laura Neumann who attended the SysMus conferences in Genova (2013) and London (2014) has organized SysMus 2015 with tremendous commitment and energy – I would like to thank her and her team for their effort!

It is in the spirit of the versatility and programmatic openness which rings through the SysMus endeavor that I would like to welcome you to Leipzig for SysMus 2015!

Prof. Dr. Sebastian Klotz  
Chair of Systematic Musicology  
Acting head of the Department of Musicology, Leipzig University

Welcome to SysMus15!

It is a privilege to welcome you to the 8th International Conference of Students of Systematic Musicology. By choosing Leipzig, the founders of SysMus and especially Manuela Marin pay a tribute to our institute which it otherwise rarely received, although Systematic Musicology in Leipzig chaired by professor Sebastian Klotz is synonymous for versatile, interdisciplinary and diverse studies and research, generating a great many of interesting works during the last years.

Leipzig did not only play an essential role in systematic music research in recent history. In 1879, Wilhelm Wundt established the first institute of experimental psychology and, together with his team, set the standards for empirical psychology valid to this day. He elevated the study of the human brain from a purely philosophical context into the realm of natural sciences by investigating essential functions and connections within the brain based on music. On the last day of the conference you can look forward to personally take a look at Wundt's carefully preserved collection of scientific equipment.

Apart from being host to historically important locations concerning music, like St. Thomas Church or Gewandhaus, Leipzig also has a one of a kind well-respected museum for musical instruments where you can admire the oldest preserved clavichord in the world. I am looking forward to you all joining us on a guided tour of this noteworthy institution conducted by former and present students of the institute of musicology.

The goal of SysMus, as emphasized by its founders, is to provide opportunities to students to gain hands-on experience in organizing such an event and giving oral presentations, developing a network and meeting renowned scientist they most likely will not have the chance to meet in everyday university life. This year it is my great pleasure to welcome three well renowned keynote speakers with a greatly varying scientific backgrounds: Dr. Daniela Sammler and her keen interest in music-language relations, Prof. Eric Clarke, attending SysMus already for the 2nd time, who will hopefully give us an insight in his latest findings in ecological music psychology, and last but not least Prof. Matthias Vogel, whose groundbreaking work on musical meaning is in my opinion still not given the international scientific recognition it so clearly deserves.

I hope this interesting schedule will make for three thrilling and memorable days in Leipzig!

Laura Neumann  
Conference Chair

## SCHEDULE

Please note: All sessions will take place in the Auditorium, Beethovenstr. 15, 04107 Leipzig, except parallel sessions (Room 14.16).

### Thursday, 17 September

09:00–09:30 Registration

09:30–10:00 **Welcome Address — Prof. Sebastian Klotz | University of Leipzig**

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10:00–11:00 KEYNOTE SPEECH 1

Prof. Eric Clarke | University of Oxford

**Systematically studying the unsystematic: creativity and empathy**

Chair: Paul Elvers

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11:00–13:00 PANEL PRESENTATION 1

#### **Musicology as Activism**

Helena Lopes Braga | Central European University, Budapest

João Romão | University of Leipzig

Filipe Gaspar | New University of Lisbon

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13:00–14:00 Lunch

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14:00–15:30 PAPER SESSION 1

Session Chair: Sarah Sauvé

#### Music Sociology

Katherine Sanfilippo | Goldsmiths, University of London)

**Creating Together: How improvisation in music affects social bonding**

Lia Bergmann | Humboldt-University of Berlin

**Choral Singing behind Bars and its Meaning for the Inmates**

Dahlia Borsche | Humboldt-University of Berlin

**Berlin noise. Venues and the emergence of scenes**

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15:30–16:00 Coffee Break

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16:00–17:30 PAPER SESSION 2

Session Chair: Alexander C. Faschon

#### Linguistics & Analysis

Sebastian Trump | Nuremberg University of Music

**Towards a model of evolutionary development in improvised music**

Charles De Paiva Santana, Ivan Eiji Yamauchi Simurra | University of Campinas

**Modeling, Simulating and Analyzing: Audio Features in G. Ligeti's Desordre**

Sabrina Sattmann | University of Graz  
**Musical structure and chills in self-selected popular and classical music**

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17:30 - 18:00 Coffee Break

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18:00 - 19:30 PAPER SESSION 3

Session Chair: Mathias Schwarz

Music & Computing

Marc Moglen | University of Leipzig

**Adapting the Ecological Approach of Sound Perception to Virtual Systems**

Yuri Behr Kimizuka | Santa Catarina State University, Florianópolis

**Listening: from the most subtle nuances of digital recordings to the vintage noise of vinyl**

Marco Bussi | Queen Mary University of London

**Relative salience in polyphonic stimuli**

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20:00 Conference Dinner

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## Friday, 18 September

10:00 - 11:00 KEYNOTE SPEECH 2

Dr. Daniela Sammler

Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig

**Syntax in a pianist's hand: Principles of motor planning in expert pianists**

Chair: Anne-Marlen Gaus

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11:00 - 13:30 PANEL PRESENTATION 2

Cultural and Cognitive Approaches to Unfamiliar Repertoire

(Chair: Anne-Marlen Gaus)

Isobel Clarke, Vera Fonte, Bruno Bower & George Waddell

Royal College of Music, London

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13:30 - 14:30 Lunch

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14:30 - 15:30 PAPER SESSION 4

Session Chair: Roberta Bianco

Music & Cognition

Chia-Han Yeh | National Taiwan University

**Neural Responses to Popular Heartbreak Songs and to Rock Songs: An fMRI Study**

Sarah Sauvé Queen Mary University of London

**The effects of musical training on auditory grouping**

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14:30 - 15:30 PAPER SESSION 5

Session Chair: Natalie Kohler

Perception & Action  
(R. 14.16)

Diana Kayser | University of Oslo

**Studying Facial Expressions in Reaction to Music**

Gina Emerson | Humboldt-University of Berlin

**Gesture-sound causality from the audience's perspective: investigating the influence of mapping design on the reception of new digital musical instruments**

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15:30 - 16:00 Coffee Break

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16:00 - 17:00 PAPER SESSION 6

Session Chair: Dahlia Borsche

Ethnological Perspectives I  
(R. 14.16)

Maja Preitz | Martin Luther University of Halle-Wittenberg

**The Buddhist Monk as a Musician – Manifestation of the social system within the Tibetan monastic community through music**

Niklas Meier | Berlin University of Arts

**Vocal acoustic semiotics in western/westernized pop singing through the example of K-Pop**

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16:00 - 17:00 PAPER SESSION 8

Session Chair: Michael Blaß

Rehearsal & Performance I

Raquel Rohr | Federal University of Minas Gerais, Belo Horizonte

**A historical outline of Cello performance in Brazilian Popular Music**

Davi Mota, Tairone Nunes Magalhaes, Aluizio Oliveira & Maurício Loureiro | Federal University of Minas Gerais, Belo Horizonte

**Characterization of vibrato and bending in performances on the electric guitar**

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17:00 - 17:30 Coffee Break

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17:30 - 18:30 PAPER SESSION 7

Session Chair: Stephanie Yim

Ethnological Perspectives II

Michael Blaß, Tim Ziemer | University of Hamburg

**Blowing pressure dependent synchronization in the Zummâra**

Marie Hoffmann | Humboldt-University of Berlin

**Ensemble interaction in a roda de samba: musical knowledge and social aspects**

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17:30 - 18:30 PAPER SESSION 9

Session Chair: Kim Grote

Rehearsal & Performance II  
(R. 14.16)

Eva Matlschweiger | University of Graz

**Music rehearsals and well-being**

Carolin Scholle, Christoph Louven | University of Osnabrück

**The consistency of continuous ratings and retrospective overall judgements for live performances**

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18:30 - 19:30 PAPER SESSION 10

Session Chair:  
Katherine Rose Sanfilippo

Rhythm & Synchronisation

Esther Coorevits | IPEM, Ghent University

**Synchronization in ensemble performance: the sniff as a temporal cue**

Lisa Krüger, Patrick Becker | Humboldt-University of Berlin)

**Synchronization of movement and gestural communication in Jazz improvisation**

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**Saturday, 19 September**

9:30 - 11:00 PAPER SESSION 1

Session Chair: Esther Coorevits

Music & Interaction

Alessandro Miani | Aarhus University

**The social neurochemistry of music as a tool for courtship: cooperation or competition?**

Liubou Pazniakova | IPEM, Ghent University

**The influence of tempo, modality, expertise and movement on conductor- musician synchronisation**

Alana Blackburn | University of New England, Armidale

**Creating Harmony: exploring the organisational factors of contemporary chamber music ensembles**

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11:00 - 12:00 KEYNOTE SPEECH 3

Professor Matthias Vogel | University of Giessen

**Music and its Place in Human Life-form**

(Chair: Diana Kayser)

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12:00 - 13:00 Lunch

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13:00 - 14:30 PAPER SESSION 12

Session Chair:  
João Nuno Cardante Romão

Music & Emotions

Flemming Kristensen | University of Würzburg

**The influence of parental support and the valuing of music on self-regulation/self-efficacy in young musicians**

Manuel Anglada Tort | Goldsmiths, University of London

**Musical Judgements under Uncertainty: Am I Listening to the Same Song?**

Paul Elvers | Max Planck Institute for Empirical Aesthetics, Frankfurt / Main

**Listening to Empowering Music – Music-Induced Manipulations of Self-Esteem**

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14:30 - 15:00 Closing Session, Discussion

Session Chair: Esther Coorevits

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16:00 - 17:30 Grassi Museum of Musical Instruments  
(Guided Tour)

Prof. Eric Clarke | University of Oxford

### **Systematically studying the unsystematic: creativity and empathy**

Some aspects of music/musicking seem to lend themselves to systematic approaches because, intuitively, they themselves appear to be systematic: there have been interesting and productive systematic studies of the tonal system, of rhythmic organization, of expressive performance, of what makes music more or less memorable, or more or less 'idiomatic' for an instrument – and much more. But what about other, apparently more ill-defined aspects of music/musicking? In this paper I discuss the opportunities and shortcomings of studying creativity in music, and investigating the hypothesis that music may be a medium for empathy, from a systematic perspective. I refer to the methods and findings of a recent project on collaborative creativity between composers and performers that formed a part of the Centre for Musical Performance as Creative Practice (CMPCP); and to another recent project on music, empathy and cultural understanding, which tackled this rather elusive and multi-faceted question using both critical and empirical methods. There is no necessary reason to restrict systematic methods to apparently systematic phenomena – indeed, to do so might risk being artificially self-confirming; but equally it may sometimes seem perverse, or simply unproductive, to try to apply methods that seem at odds with the questions that they seek to address. Using these two projects as my examples, I end by considering the successes and problems of the methods used in these two cases.

**Prof. Eric Clarke** went to the University of Sussex to read for a degree in neurobiology and graduated with a degree in music. After an MA in music, he was awarded a PhD in psychology from the University of Exeter, and became lecturer in music at City University in London in 1981. He was appointed as James Rossiter Hoyle Professor of Music at Sheffield in 1993, and took up the post of Heather Professor of Music at the University of Oxford in October 2007. Professor Clarke is an Associate Editor of the journals *Music Perception* and *Musicae Scientiae*, is on the editorial boards of *Empirical Musicology Review*, *Radical Musicology*, and *Per Musi*; and is a consulting editor for *Psychology of Music*. He was an Associate Director of the Arts and Humanities Research Council's Research Centre for the History and Analysis of Recorded Music ([CHARM](#)) from 2004-2007, is an Associate Director (2009-2014) of the AHRC Phase II Research Centre for Musical Performance as Creative Practice ([CMPCP](#)), is on the Advisory Council of the Institute of Musical Research (IMR), and was elected to membership of the Academia Europaea in 2009.

His research and teaching cover a number of areas within the psychology of music, music theory, and musical aesthetics/semiotics. He has published widely in journal articles and book chapters on topics including expression in performance, the perception and production of rhythm, musical meaning, the relationships between music and language, the analysis of pop music, the history and aesthetics of recorded music, and music and the body.

Dr. Daniela Sammler  
Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig  
**Syntax in a pianist's hand: Principles of motor planning in expert pianists**

Over the past 20 years, research on the neurocognition of music has gained a lot of insights into how the brain perceives music. Yet, our knowledge about the neural mechanisms of music production remains sparse. One aspect that has been studied particularly well in perception is musical syntax, i.e. the processing of harmonic rules in the auditory signal. The present talk will demonstrate that the notion of syntax not only applies to the auditory modality but transfers – in trained musicians – to a “grammar of musical action”. I will present a series of neuroimaging experiments that show (i) that the performance of musicians is guided by their music-syntactic knowledge – irrespective of sounds, (ii) that syntax takes priority over the selection of finger movements during piano performance, (iii) that training style (classical vs. Jazz) has an impact on syntactic motor planning, and (iv) that syntax perception and production in music overlap partly – but not fully – in the musician's brain. Altogether, these results show how strongly musicians rely on syntax as a scaffolding that facilitates their performance and enables them to achieve the motoric proficiency that is required on stage.

**Dr. Daniela Sammler** is the leader of the Otto Hahn Group "Neural Bases of Intonation in Speech" at the Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, where she also finished her Ph.D. studies with her doctoral thesis on "The neuroanatomical overlap of syntax processing in music and language - Evidence from lesion and intracranial ERP studies" in 2008. Moreover, she was Visiting Researcher of the Institute of Psychology and Neuroscience at the University of Glasgow and awarded the Otto Hahn medal from the Max Planck Society in 2010. She is member of the Society for the Neurobiology of Language (SNL), the Organization for Human Brain Mapping (OHBM), and the Deutsche Gesellschaft für Sprachwissenschaft (DGfS), as well as scientific staff member of the Scientific Council of the Max Planck Society. Daniela Sammler is an expert in the field of cognitive linguistics and musicology and has published several articles on topics including syntaxes in speech and music, cognitive representations of familiar and unfamiliar songs as well as the recognition of emotions in music.

Prof. Mathias Vogel | University of Giessen  
**Music and its Place in Human Life-form**

It's easy to imagine beings that are able to think about their world and themselves but don't have music. And it is almost certain that those beings would not be human beings, since we simply don't know any human society without music. But why is that so? And what is so special about music that it has to count as a fundamental ingredient of our life-form?

In my talk I will argue that these two questions cannot be answered independently from each other. One cannot determine what kind of phenomenon music is apart from acknowledging and understanding the fact that it doesn't exist without human beings. Music, after all, is an artifact, and to understand the essence of an artifact implies understanding the rationale of its existence or its function. But, to determine the function of music we need to know what music is and what it is not.

So we face two intertwined tasks: answering the question of what music essentially is and why this makes it essential for our form of life. In my talk I will try to demonstrate that both tasks can be achieved by a theory of reenactment: Music is sound that exists because of the possibilities it offers to reenact its (musical) properties; whereby reenactment is a basic form of understanding, and collective reenactment is a form of experiencing social coherence.

**Prof. Matthias Vogel** is Professor for Theoretical Philosophy at the University of Giessen and was Visiting Professor in Vienna as well as assistant researcher at the University of Frankfurt. He studied philosophy, general linguistics, physics, history, and historical and systematic musicology in Hamburg, where he finished the master's degree in Philosophy in 1989 (Minors: Historical and Systematic Musicology). Matthias Vogel received his doctorate in 1994 and since has published numerous writings about processes of understanding and reenacting musical meaning, the construction of knowledge, and the similarities between music and language in a philosophical perspective.

## Musicology as Activism

*The delicate mechanisms of power cannot function unless knowledge, or rather knowledge apparatuses, are formed, organized and put into circulation*  
FOUCAULT, 1976: 33-34

*Like any other social discourse, music is meaningful precisely because insofar as at least some people believe that it is and act in accordance with that belief. Meaning is not inherent in music, but neither is it in language: both are activities that are kept afloat only because communities of people invest in them, agree collectively that their signs serve as valid currency.*  
MCCLARY, 1991: 21

### Introduction

The discourses of truth surrounding music are permeated by multiple power dynamics such as gender, class, race, ethnicity, religion, geography, etc. To acknowledge this is not enough. We have the obligation to question what this field we're in is contributing for. We have to ask ourselves some urgent questions:

How are we engaging in truth-effects: are we to remain quiet and follow the religiousness of this academic field? How can we act upon these same truth-effects?

In 1993 Philip Bohlman announced that musicology is a political act, to those who were refusing to see it. But in 2015 it still seems many insist in a sacralized science... It is not at stake if musicology should or can be political, but rather how we can interfere in its ideologies, given that we are aware of our role in its discourses and practices as both power-effects and truth-effects.

This will be a first step towards the articulation of concepts and theories from several fields, in order to destabilize the limits of scientific fields and science in itself. We will propose an assumedly partial situated approach to the study of music that engages in our vision of the world as political.

### Towards a utopian epistemology of music: a feminist self-reflection

Critical theory and post-structuralism influenced the understanding of music and musicology as a participating tool in the social order which therefore assured that it cannot still be studied as an apolitical object and within the system of truth that musicology has become. This created solid ground for exploring how ideas about the body, identity,

difference, and hierarchical power relations, are constructed and maintained through music and musical practices and discourses.

Research on women in music was a reality at least since the 1970s, but as McClary argues, it existed in a “separate sphere-tolerated, but largely ignored by the discipline’s mainstream and little known outside musicology.”(1993: 399) It was in the 1990’s that the field of feminist musicology emerged triggered especially by Susan McClary’s *Feminine Endings*. Her claims that the musical canons, analytical methodology and the field of musicology itself was misogynist raised huge controversy and, easy to foresee, much hate speech. It became a separate field within musicology, although the purpose has always been an integrative one. However, feminist musicology is still broadly seen as a subjugated knowledge, “knowledges that have been disqualified as non conceptual knowledges, as insufficiently elaborated knowledges: naïve knowledges, hierarchically inferior knowledges, knowledges that are below the required level of erudition or scientificity.” (Foucault, 1976: 7)

In 2015 how does a feminist musicologist or social theorist engage in a critical and self-aware practice? How can a feminist critique of music (in a broad sense) contribute to a crystallized, although invisible and underestimated, science? What does it mean to invest in a feminist musicology? How can this investment lead to new understandings, methodologies, languages, within a framework of freedom – the only aimed framework for knowledge - and, however subtle the struggle might be, fight truth-discourses surrounding music?

Acknowledging my partial perspectives and assuming an anarcha-feminist ideology, I propose a reflection on feminist analysis of musical practices, repertoires, cultures, etc, assuming musicology as a way of activism. I will explore possibilities for us - as power-effects - to question and subvert musicological given truth-effects.

### What is Portuguese musicology committed to?

Culture in Portugal has suffered an intensive divestment at least during the last decade. The budgets of the Ministry of Culture faced severe cuts, culminating in its extinction in the present legislature with the excuse that Culture is not a priority in the current economic crisis. Alongside other artists, musicians still lack a clear professional statute, which leads to job insecurity. At the same time there is not a systematic and public debate about these matters, neither from the few active music critics nor from the musicological academy in the broader sense. The most influential of these narrow their activity in the media to “conservative or liberal canonic discourses” (Everist, 1999: 389-391) about the choices of repertoire and performing practices of the musical institutions.

This paper aims to analyze the paradoxical attitude of music researchers in Portugal by trying to understand to what extent their silence or their apparently apolitical discourses reveal “instruments of domination” (Bourdieu, 1977: 408-411) by replicating the

logic that music possesses an intrinsic value, and consequently promoting the distinction between groups of people: those who control “the order of discourse” (Foucault, 1970) and those who have different experiences and musical backgrounds. Given that I am about to finish a Master’s in Musicology and I recently started to write music criticism in an online music magazine, I felt the need to think about my responsibility as a musicologist, thus a citizen that holds the methods and knowledge to question the *status quo* and promote a more transparent presentation of the ideological and political implications of cultural agents’ actions in today’s Portuguese Democracy. Keeping in mind Foucault’s alert, this analysis must also be auto-critical, since my discourse both as a musicologist and as a music critic is already an example of Power.

### Music /Politics interface or the invisible character of musicology

Eric Drott in *Music and the elusive revolution: cultural politics and Political culture in France, 1968-1981* (2011), argues that the music / politics interface was far from being a peaceful one during this period: “the border between culture and politics is opened up [...], but traffic is only allowed to flow in one direction: politics invests the cultural field, but movement in the opposite direction is not admitted” (Drott, 2011: 14).

In this paper I want to reflect on the consequences of the disengagement between politics and music along the second half of the twentieth-century with the account of the supposed apolitical character of science in general and musicology in particular. There are several starting questions regarding this topic. What has musicology done for a democratization of the appropriation of music by the individuals and social groups? How is the symbolic and effective power distributed in this music / politics interface? What is at stake with the state funding of music and music research? How does musicology acts on its invisible character on everyday cultural life? Is there a symbolic power of prestige on the state funding of music? Who profits from these distinctions? How do (not) the decision makers - directors, programmers of music institutions - engage with the musicological narratives? Does musicology still matters?

Through all these questions I will explore the invisible character of musicology within a wider perspective about the place of social sciences and humanities in a capitalist, profit-oriented society that we have the responsibility to call into question.



**Helena Lopes Braga** is currently a PhD candidate in Gender Studies at the Central European University in Budapest, under the supervision of Professor Francisca de Haan. She holds an MA (2014) and BA (2011 – for which she was granted the Merit and Excellence Award Luiz Krus) in Musicology from the Faculty of Social and Human Sciences of the New University of Lisbon. Lopes Braga is a researcher of the Sociology and Musical Aesthetics Research Center (CESEM, FCSH-NOVA), where she was co-founder of NEGEM (Study Group on Gender and Music) and SociMus (Advanced Studies in Sociology of Music). Her fields of study are feminist musicology, sociology of music, women's and gender history. Her research interests include: women composers and musicians, study of networks through intimacy and identity, Portuguese women's and gender history (20th century), left-wing women's political activism. She was vice-President of the Portuguese Society for Music Research (SPIM-PSMR) from 2013 to 2015.

**Filipe Gaspar** completed his Bachelor's degree in Musicology in 2013 – for which he was awarded *The Merit and Excellence Award 2012/2013* – and is about to finish his Masters in Musicology, both at the Faculty of Social and Human Sciences of the New University of Lisbon (FCSH-NOVA). He was an intern at D. Maria II National Theatre, in a partnership between this institution and the Portuguese-Brazilian Studies Research Group of the Sociology and Musical Aesthetics Research Center (CESEM, FCSH-NOVA), created for digitalizing and cataloging the theatre's music sheet collection. In November 2012 he won a fellow grant and became a member of CESEM's *"Theatre of Laughter": The musical comedy in theatres of Portuguese language (1849-1900)* project, under which he is currently developing his Master's dissertation on the operetta *O Burro do Sr. Alcaide* and the Portuguese composer Ciríaco Cardoso (1846-1900). He was the Secretary of the Portuguese Society for Music Research (SPIM-PSMR) from 2013 to 2015. Since March 2015 he writes music criticism in *Glosas* online magazine.

**João Romão** is a PhD candidate in Musicology at the Institut für Musikwissenschaft, Universität Leipzig under the scientific coordination of Professor Sebastian Klotz. He has a Bachelor (2010) and Master (2013) degree in Musicology at Faculty of Social and Human Sciences, New University of Lisbon (FCSH-NOVA) and is a researcher at the Sociology and Musical Aesthetics Research Center (CESEM, FCSH-NOVA) since 2009 where has been enrolled in a large amount of research projects and research groups on sociology of music, music criticism, music and institutions of the twentieth-century and music and gender. After finishing his MA thesis on music criticism during the last years of the Portuguese dictatorship (1970-1974) he is studying the connections between Darmstadt School and a series of festivals of contemporary music during the second half of the twentieth-century as the Contemporary Music Meetings at Calouste Gulbenkian Foundation. He was also the President of Portuguese Society for Music Research (SPIM-PSMR) from 2013 to 2015.

## Cultural and Cognitive Approaches to Unfamiliar Repertoire

### Introduction

The modern tradition of western classical music performance faces an apparently conflicting set of values. On one hand is the tradition of familiarity, in which a relatively small repertoire dominates concert programmes and studio recordings. On the other, there is a desire for innovation, fed by the discovery of lost works, invention of new ones, and reinvention of classics. The topic of unfamiliar repertoire will be the focus of this panel. By employing a variety of methodological approaches, from historiography to ethnography to quantitative analysis, these four presentations will attempt to survey the issues surrounding unfamiliar music.

The first presentation will undertake a practice-based historical examination of rediscovered early Baroque repertoire, contextualising it within the historically informed performance movement and questioning its value for musicians and listeners alike. The second presentation will focus on the relationship between performer and composer, with qualitative documentation of the process by which performers learn and memorise challenging new repertoire. The panel will then shift focus to an example of meditation between composer/performer and audience: the analytical programme note. Using their nineteenth-century origins as a model, the third presentation will highlight the dual role of programme notes in contextualising unfamiliar music while simultaneously reflecting and shaping the musical ecology in which they existed. Finally, the role of the audience will be considered, with the presentation of new experimental data demonstrating how trained listeners undergo different processes in how they evaluate familiar vs. unfamiliar stylistic material.

By following the transfer of unfamiliar repertoire from generation and discovery to mediation to perception, this panel will invite a larger discussion of the opportunities and challenges invoked by unfamiliar music in the western classical tradition. It will examine who creates it, what shapes its presentation, and what audiences and musicians alike gain from the endless pursuit of novelty.

### Discovery for discovery's sake?

The historically informed performance movement is one of the great musical paradoxes of the twentieth century. Generally, it is presented as a retrospective practice, rooted in the traditions of the past; yet essentially it was created as a new, innovative and in

many ways very modern performance style. Listeners have become increasingly familiar with this revolutionary approach to performing early repertoire. Performers are therefore under a constant pressure to explore and push the boundaries of performance style still further, and to rescue unknown historical repertoire from centuries of obscurity, essentially presenting it as 'new music'.

This paper sets out to analyse the rediscovery and performance of nonmainstream early repertoires, through an approach combining historiography, primary source research, and examination of current and twentieth-century performance trends. Three rediscovered seventeenth-century collections are used as case studies for the exploration of this approach: the Op. 3 and 4 violin sonatas by Giovanni Antonio Pandolfi (1664, Innsbruck); Giovanni Battista Riccio's *Il terzo libro delle divine lodi* (Venice, 1620); and a set of violin sonatas composed by a Flemish musician, Philipp van Wichel (Antwerp, 1678). Integrating practical and historical approaches, the particular challenges these works present to the practitioner are examined.

Looking at the wider perspective, this practice-based approach serves to effect an analysis of the potential implications which performance of this repertoire holds for the historically informed performance movement. Who benefits more from the presentation of 'new' early music: the performer, the musical historian, or the listener? Does the rediscovery and performance of such works have a marginalising effect on the historical performance movement? And finally, is concert performance of these often obscure compositions really historically informed performance – and should we care?

#### The influence of collaborative practice between performer and composer in the memorisation of contemporary music

This presentation addresses a self-case study in which a pianist learned and memorised a commissioned contemporary work during two main stages: first, she started by practicing and memorising the piece on her own and, afterwards, she carried out this process while closely collaborating with the composer, culminating with a memorised performance of the piece.

Research in expert memory, mainly based in tonal music, revealed that when musicians perform from memory they develop retrieval schemes using landmarks. Their previous knowledge of musical structures and commonly encountered patterns in the score allows them to keep track of where they are during a memorised performance. However, given the nature of contemporary music, where composers frequently reject traditional patterns and structures, memorisation can become a challenge to performers.

The present study explores how, and to what extent, those retrieval schemes apply to the memorisation of music not following a tonal approach and it will provide insight into the influence of direct contact with the composer in this process.

The pianist video-recorded her individual and collaborative practice sessions and final performance. Concurrently, she noted her musical and technical decisions in different scores spread over time during practice sessions. She also provided reports on the score after the performances with her thoughts during performance. Qualitative analyses of the type of thoughts used during these different stages of learning and performing was carried out in order to explore how she encoded and retrieved the piece and how this process evolved over time and under different conditions (individual/collaborative practice). Moreover, an analysis of the number and location of starts and stops during practice allowed for further understanding about how her approach to practice influenced the development of her retrieval schemes in performance.

The results provide insight into how musicians may develop retrieval schemes in the context of music that is tonally and structurally less familiar and how direct contact with the composer can contribute to this process.

#### Unfamiliar music in the programme notes of the Crystal Palace Saturday Concerts, 1865–1879

Analytical programme notes are a surprisingly recent invention, emerging as a common practice in Britain during the 1840s and 50s. Previously, sheets of paper handed out at concerts would include only lists of works, performers' names, and song texts. Programme notes served as a new kind of mediation between music and audience, with authors deploying a wide range of explanatory material to contextualise the music. Ethnographic readings of these sources can provide insight into such social issues as class, education, religion, politics, race, and, importantly to the present discussion, the relationship between audiences and their understanding of unfamiliar music.

In this presentation, the programme notes of the Crystal Palace Saturday Concerts serve as a case study into the relationship between music and audience in the Victorian period. This series, comprising ca. 26 performances a year, held a key position in London concert life during the 1860s and 70s as one of only a few public venues to host high-quality orchestral concerts. Importantly, audience members were able to buy tickets for individual concerts on the day, rather than the customary season subscriptions, making them accessible to a much broader demographic. The accompanying programme notes were composed by a variety of authors, including Sir George Grove. He later used them as foundations for some of his entries in the *Dictionary of Music and Musicians*, making them of central importance to the development of English musicology.

Critical readings of these sources reveal how writers tended to assume that all the music presented could be potentially unfamiliar to the new audiences, no matter how frequently these pieces had been performed previously. This information helps enrich our understanding of the relationship between music and audience in the Victorian period. It also helps us understand our own attitudes to music, as many of the issues are still embedded in present-day programme notes.

## Temporal effects of repertoire and stylistic familiarity on performance quality evaluations

It is assumed in situations of music performance quality assessment that the same process will be used to evaluate familiar and unfamiliar repertoire. Previous research, however, suggests that this is not the case, though these findings usually focus on single summary judgements. As music performance, and thus assessment, is a temporal practice, continuous measurement (CM) techniques allow for an examination of the entire process of evaluative decision making. Very few studies have applied CM to quality evaluation research, and the present inquiry represents its first use in examining effects of repertoire familiarity (among other variables) on the evaluative process.

Four high-quality recordings were produced varying in work familiarity while matched for tempo, texture, technical difficulty, and performance quality. These comprised: two very familiar works of Chopin (the 'Black-key' Etude and the 'Minute' Waltz); a less-familiar Chopin work (the Tarantelle in A-flat); and one very unfamiliar work by an unknown composer using an unconventional tonal language (Caprice No. 6 by Sophie Carmen Eckhardt-Gramatté). Forty-two trained musicians were instructed to rate the recordings based on the quality of the performance, moving a mouse pointer horizontally across the screen to record their continuous response. A written questionnaire followed each work requesting an overall judgment of performance quality. Presentation order was randomised.

ANOVA revealed that familiarity of the Chopin works did not affect the time taken to form a first decision, with a mean time of ~15s recorded (in line with previous research). However, the Eckhardt-Gramatté work resulted in a significantly longer mean time to first judgment of ~35s. Furthermore, repeated-measures ANOVA at 10s intervals with reverse simple contrasts indicated that, as a group mean, a final decision took 3 times longer (~90s vs. ~30s) to reach for the Caprice vs. the Chopin repertoire. These results suggest that the process by which quality judgements are formed may be systematically affected by stylistic familiarity, though not by general familiarity with the composer.

**Isobel Clarke** is a doctoral candidate at the Royal College of Music in London, where her research focuses on reconstructing the practical use of the recorder in the seventeenth century. She returns to the RCM as a research student having completed her BMus in historical performance at the same institution, and is active as a performer of both early and contemporary repertoires. Recent additional research activities have included collaboration on the AHRC-funded Listening Experience Database Project (RCM/Open University) and input to a major RCM research and performance project on music and emigration, *Singing a Song in a Foreign Land*. Isobel is grateful to be able to pursue her doctoral studies as an RCM Scholar, supported by a Douglas & Hilda Simmons award.

**Vera Fonte** is a doctoral candidate in the Centre for Performance Science and a Royal College of Music Scholar supported by a McFadzean Whyte Award. Her research examines music memorisation, predominantly in the contemporary piano repertoire. Vera graduated in piano performance at the University of Minho under the tutelage of Luís Pipa, where she also completed a master's degree in music teaching. Her master's thesis focussed on the memorisation of fugues by J. S. Bach. As a pianist and academic she has won numerous student awards and is a prizewinner of several piano and chamber music competitions. A performer of solo and chamber repertoire, she has premiered works by contemporary composers. In 2013 she became vice president of the Portuguese branch of European Piano Teachers Association (EPTA Portugal).

**Bruno Bower** read music at Oriel College, Oxford, and studied for a Postgraduate Diploma on oboe at Birmingham Conservatoire. He received a distinction for his MMus from King's College London in 2012. He is now in the final year of a PhD at the Royal College of Music, focusing on critical readings of nineteenth-century programme notes, aiming to illuminate the ideas and ideology surrounding music in Victorian Britain. In particular he has been studying the notes for the Crystal Palace Saturday concerts for the period 1865-1879. His doctoral work is supported by a Lucy Ann Jones and a Douglas and Hilda Simmons Award, as well as an AHRC Doctoral Studentship.

**George Waddell** is a doctoral candidate in the Royal College of Music's Centre for Performance Science. He is an RCM Scholar supported by a McFadzean Whyte Award. His research focusses on the processes underpinning performance quality evaluations, using continuous measures techniques to track decision-making over time. As a GTA he lectures on experimental design, statistical analysis, and the psychological underpinnings of musical creativity, interpretation, and evaluation. George completed his BMus and MMus in piano performance at Brandon University (Canada) while completing courses in psychology. He was awarded the Brandon University Gold Medal for the Master of Music Degree, was a recipient of the Manitoba Graduate Scholarship, and holds an ARCT Diploma in Piano Performance from the Royal Conservatory of Music in Toronto.

## Music Sociology

Katherine Sanfilippo | Goldsmiths, University of London

### **Creating Together: How improvisation in music affects social bonding**

One of the key functions of music is its ability to create social bonds and communities. Researchers have so far attributed this social bonding effect to synchronization of movements between co-actors, mediated by the release of endorphins. However, the human ability to use musical creativity and improvisation might also have important consequences for the establishment and maintenance of social groups and identities. I hypothesize that the creative aspect of music will heighten the social bonding effect already found when people synchronize together while making music.

This study uses a 2 x 3 mixed design with participants placed in one of three conditions and a pre/post activity measurement of social bonding. I compare the following conditions: (i) complete synchrony but no improvisation or complexity (unison), (ii) coordination and complexity but no improvisation (four part harmony), and (iii) coordination, complexity and improvisation (improvisation). I will report participants' pain thresholds (a proxy for endorphin release) before and after singing as well as self-report measures of affect and social bonding.

This research is the first to look at the effect improvisation has on social bonding. It will allow for a better understanding of the beneficial effects and evolutionary purpose of music. Those who engage with improvisation in music seem to experience an intense collaboration when every musician is participating in creativity and this study will begin to uncover the mystery and importance of this experience.

**Katie Rose Sanfilippo** is a master's student at Goldsmiths College, University of London. She is in the Music, Mind and Brain program and hopes to someday complete her PhD in music psychology. She has two bachelor degrees, one in general psychology and another in vocal performance and choral conducting. She completed her undergraduate degree, as valedictorian of her class, from Loyola Marymount University in Los Angeles, California. Originally from the San Francisco Bay area, she has always enjoyed engaging with music as both a singer and a trombone player. She has played in jazz combos and has performed with an elite choral group that have toured all over Europe as well as sung in beautiful venues such as the Sistine chapel. She trained in ballet, tap, jazz and modern dance until the age of 18.

Lia Bergmann | Humboldt-University of Berlin  
**Choral Singing behind Bars and its Meaning for the Inmates**

What makes up a life when you are in prison – when have lost your family, your job and even the power to make your own decisions? For many inmates this is certainly not an easy question to answer. In prison, people are left alone with their problems most of the time, which can lead to mental illness or mortify the prisoners' selves. What many of them need, are means of escape, a group in which they feel safe and secure, and especially something that fortifies their selves again.

In this paper I will, based on the theories of Erving Goffman and George Herbert Mead, discuss whether singing in a prison choir is suitable to provide these means. My hypotheses are verified through guided interviews and through a focus group with prisoners from Hamburg and Brandenburg. Assuming that prisoners can find a save place within the choir group, one can reason that they might also get the chance to express their selves there. The songs' emotionality can not only touch the prisoners in their special situation, but also function as a repository of memory, which directly reawakens thoughts and feelings from the past. Anyway prisoners will, more or less, be confronted with their inside, which can touch sore spots. In this way, music may be the first step in learning to deal with personal problems – and in strengthening people again. Furthermore, getting positive feedback can affect singers in a profound way. It can make them feel not only worthy, but also competent in doing something meaningful.

The question to be answered finally is, whether singing can help prisoners to manage their lives under arrest. Can its positive effects support them in dealing with personal problems and strengthen their selves in the end?

**Lia Bergmann's** interest in *choral singing in prison* started in 2011, when she wrote her Bachelor thesis at Philipps-University in Marburg on this topic. She continued studying at Humboldt-University Berlin and went on doing her research there. By now she is working on her Master thesis, which she will probably finish in October this year. Beyond that, she voluntarily works as a probationary assistant in JVA Berlin Tegel.



The relationship between place and culture and especially between the urban context and music is a rising pattern in recent musicology. Urban milieus combine heterogeneous and diverse cultural influences and expressions at the same time. Mapping musical culture and developing cartographies of sound seem to be fruitful tools for a new perspective in music studies (cp. Mapping the Beat, 1998; Partituren der Städte, 2015, and many others). The impact of different venues on the constitution and manifestation of (sub-)scenes is one emerging result of my PhD project which I would like to put up for discussion at the International Conference of Students of Systematic Musicology.

My empirical dissertation focuses on music that mainly deals with noisy (geräuschhaft) sounds and has been performed in Berlin in 2012. With this focus I try to overcome established borderlines between different genres and scenes. With the aid of methodological triangulation I want to uncover interconnections between contemporary music styles (new music, sound art, noise etc.). Therefore I examine sound characteristics (music analysis), self-perceptions (qualitative interviews), and performance contexts (field research) of different music phenomenon whose obvious common denominator is the use of noises.

After interviewing about 25 musicians from different music scenes dealing with noises and sound based music the classification in categories unfolds several strands for further analysis. One of them is the constituting role of the places where music is performed. At these venues scenes can be experienced as a community for the audience, they are meeting point and provide room for identification in many ways. On the other hand you can draw conclusions from the more or less flexible use of venues by musicians about the specific “sceneness” (Bennett/Peterson, 2004). In my presentation I want to show how Berlin’s noise venues create and constitute scenes referring to current theories of urban studies.

**Dahlia Borsche** studied musicology, sociology, and ethnomusicology at Freie Universität Berlin. For several years she had been working as a student assistant at the special research field “Ästhetische Erfahrung im Zeichen der Entgrenzung der Künste” (FU Berlin) as well as at the international festival for electronic and experimental music club transmediale (Berlin). From 2009 to 2013 she was scientific assistant at the department for Applied Musicology at Alpen-Adria-Universität Klagenfurt. Since 2013 she is working on her dissertation about contemporary noise-music(s) (supervisor Frank Hentschel, Cologne). In February 2015 she took up her job as scientific assistant at Humboldt Universität Berlin, Lehrgebiet Musiksoziologie.

## Linguistics and Analysis

Sebastian Trump | Nuremberg University of Music

### **Towards a model of evolutionary development in improvised music**

The various aspects of the relation of evolution and music are mostly seen as processes over long periods of time. In contrast, this on-going study explores genetic structures and developments within musical improvisations. For this purpose an empirical approach is taken by recording two freely improvising musicians in separate rooms and developing custom software to preprocess and analyse the data. The structures to be tracked there refer to the processes of genetic algorithms in evolutionary computation, which try to simulate creativity by means of recombination, mutation and selection.

To transform these methods from generating into analysing musical material, they have to be reversed: Grouped sequences of sound events are merged into phenotypes, consisting of perceivable sonic features, and a hidden layer of genotypes with semantic attributes such as a certain degree of tension. Subsequently, the resulting research questions are, first, how phenotype features can be linked with genotype attributes, second, which genetic rules of heredity appear in improvisations, and third, if such a genetic system is actually useful to describe musical development.

At the current point of research, promising first results of interchanging genotypes between the musicians show the potential of such a hypothetical model of evolutionary development in improvisations. Further steps will be to refine the model with the help of larger data sets and an evaluation by implementing it into a genetic algorithm.

**Sebastian Trump** studied jazz saxophone and classical saxophone at Nuremberg University of Music. During his instrumental studies, he began focussing on live electronics and the aspects of timbre in musical structure from the very practical perspective of an improvising musician. After gaining a master in sound studies at Berlin University of the Arts, his research interests shifted towards new interfaces for music, human-computer interaction, artistic research and the logic of musical improvisation. Since 2009 he teaches music and media at Nuremberg University of Music and currently works on his PhD thesis on genetic improvisation.

This abstract presents an approach for musical analysis that combines three pioneer practices in computational musicology: (a) the elaboration of an algorithmic model from a musical score, (b) the automated generation of musical variants and (c) the analysis of resulting audio files by means of audio features.

It was demonstrated that existing musical scores can be rebuilt or generated by using computer models and it was suggested that neighboring variants can also be produced by such procedure.

In this work, our premise is that a musical score is one single occurrence of a systems particular configuration. Musical variants are envisaged by modeling the behavior of such system and modifying its parameters values. We call those variants the different instances of a piece. Being similar or unlike, instances are ontologically related. Their study result in further knowledge about the musical works inherent attributes and open for new creative possibilities

In the current stage of our research, We are developing different strategies to analyze and explore the various instances which can be produced from a model. In our study the methodology consists in generating a substantial number of instances from sets of parameters and saving them as midi files. These files are then used to generate audio files by means of samplers emulating the sound of the piece original instrumentation. Having an audio file for each instance allows us to apply a set of acoustic features which would not be possible using midi files. For the analysis of the audio files we are using the following features: centroid, flatness, irregularity, flux and RMS. We are expecting to find some correlation between the instances and the acoustic features variations.

We have been applying this methodology on the first piano study, named Désordre (1985), composed by György Ligeti (1923–2006). We consider this piece an exceptionally suitable case study for our approach as previous studies demonstrated that most of its main aspects could be generated by automated means.

For the elaboration of the algorithmic model of Ligeti's piano study we used the Common Lisp programming language. To generate the sound files we used the audio samplers present in Propellerhead Reason. Finally, to analyze the audio files, we used the software Sonic Visualizer.

**Charles de Paiva Santana** is a musicologist working in the fields of computer assisted analysis and 'modeling and simulation' of musical scores. He is currently pursuing doctoral studies at the Université Pierre et Marie Curie (Paris 6) and the State University of Campinas (UNICAMP). He has been a collaborator in several research labs including the Musical Representations Team at IRCAM (Institut de Recherche et Coordination Acoustique/Musique - France), The Interdisciplinary Center for Sound Communication (NICS - Brazil), The Institute of Research for the Development (IRD - France) and the Musicology, Sonology and Computation (Mus3) group at the Federal University of Paraiba (UFPB - Brazil).

Composer and researcher, **Ivan Eiji Simurra** performs electronic manipulations in pop music. BA in Music Composition and Master in Creative Processes at University of Campinas (Brazil). Currently, he is a PhD candidate at University of Campinas, with the FAPESP funding. He teaches Harmony, Theory and Composition. Also he develops projects relating instrumental music composition, Science and Technology and musical analysis with computer assistance. Participated in several Festivals, Master Classes and Music Workshops His works are being performed in Brazil, Argentina, Chile, Israel, Russia, Greece, Ireland and United States.

Sabrina Sattmann | University of Graz

### **Musical structure and chills in self-selected popular and classical music**

The aim of this study was to investigate the musical structures that are associated with chills (positively experienced goose bumps or shivers down the spine) while listening to music. As previous studies have focused on classical music and partly on professional musicians (e.g. Sloboda, 1991), this study considered the perception of mainly popular music by amateur musicians and non-musicians. Interviews were conducted with 15 participants (10 female). Each was asked to bring three chill- eliciting pieces of their own choice. During the interview, the tracks were played and participants indicated the chill-inducing passages verbally. Additionally, they explained why they liked the pieces, special features of the identified passages, and what emotions were evoked. To find out about variables that have nothing to do with musical structure, participants were also asked about any memories or associations to the music, whether they attended to the lyrics, and how important these were for them. Participants indicated to have experienced chills when listening to the piece for the first time in two out of three self-selected pieces. More than half of the tracks were popular, in a major key, and in four-four time, which seems to contradict Panksepp (1995) who suggested that sad and melancholy music is especially chill eliciting. Analysis of the 45 pieces suggested that chill-inducing passages are associated with changes in instrumentation, dynamics, melodic/thematic and harmonic content, as well as melodic peaks and delays of musical progressions. This replicates previous findings that chills are often evoked by musical changes (Grewe et al., 2007). Our data suggest that melodic peaks, delays of expected events, and changes of instrumentation are emotionally more important than previously assumed.

**Sabrina Sattmann** holds a Diploma (Master's degree) in Psychology and a Bachelor's degree in Musicology from the University of Graz and is currently enrolled in the Master's program in Musicology. She has played the flute for more than 20 years, performing with several orchestras and ensembles. She studied flute and elementary music education at the J.-J.-Fux Conservatory in Graz and teaches the flute in a music school in Styria since 2007. A student assistant at the Centre for Systematic Musicology from 2012 to 2014, she is now a research project assistant there.

## Music & Computing

Marc Moglen | University of Leipzig

### **Adapting the Ecological Approach of Sound Perception to Virtual Systems**

It is theorized that the evolution of sound perception is based on humans being ecologically situated in the world. Yet humans also understand sound as music and moreover adapt sound as informational referents through augmented learning systems, ostensibly – but not factually – challenging the ecological approach. These latter capacities (music and informational reference) hold the potential for sound to significantly augment learning capacity in regard to the human environment – that is, to enhance the ecological function of the auditory system. That this human environment includes virtual environments should not necessarily challenge the ecological approach. Instead, human-computer interaction represents the expansion of the auditory capacity into virtual space. In such environments we again see evidence that the ecological approach is entirely at play in the functional applications of sound.

The augmentation and adaptation of the ecological basis of sound perceptual capacity is demonstrated in several examples. (1.) Kinayoglu (2009) develops an augmented reality system imposing non-environmental sounds on the real environment, demonstrating the intimate connection between the experience of place and influence of sound. (2.) Non-diegetic informational audio by the author is presented as a compositional methodology for information dissemination within representational virtual environments. (3.) The cerebral implantation of a color-to-microtone converter allows a color-blind person to gain advanced understanding of color relations. (4.) A system for converting musical sound relations, particularly those based on the use of inharmonic partials for consonant new tonal systems (Sethares 1999), to a system that bears or could bear informational-end ecological- capacity is discussed. The argument is made that unfamiliar, new tonal systems have the capacity to bridge the confounding nature of musical aesthetics, namely that it appears "at odds with the fundamentally practical and survival-driven character of an ecological perspective." From virtual, to augmented, to real environments, the perception of sound is repeatedly demonstrated as having an ecologically pertinent basis.

**Marc Moglen** studied Psychoacoustics and Music Perception at the University of California, Berkeley, where he designed soundscapes for multi-user virtual environment research and development groups at the Center for New Media and Department of Anthropology. He was a guest lecture in "Advanced Psychoacoustics" at the University of Kent before becoming a doctoral researcher in Systematic Musicology at the University of Leipzig. Under the guidance of his supervisors Professor Sebastian Klotz and Professor William Sethares (University of Wisconsin), Moglen has lectured three university courses including

"Academic Argumentation," "Interdisciplinarity in Musicology," as well as "Experimental Tonal Practice Working Group," a tutorial for strings and voice based at the Leipzig Conservatory of Music and Theater (HMT Leipzig "Felix Mendelssohn-Bartholdy"). Conference presentations include, "Exploring New Musical Worlds," "Dialogue around Hip-Hop," "Parallels and Incongruences of the Trance Music Experience," & "Music and Robotization." He researches new tonal systems for spatially distributed audio in virtual worlds.

Yuri Behr Kimizuka | Santa Catarina State University, Florianópolis

**Listening: from the most subtle nuances of digital recordings to the vintage noise of vinyl**

Since the beginning of recording process until the coming of digital music formats, the concept of music production has changed. Despite the fact that recording technologies have been improving successively as a whole, the idea of a reliable live performance recording is different from a studio production designed to the hard media. Although in both cases the advances in technology are relevant, in studio works the relationship between media and listener is much more significant. Same analogy can be drawn between classic and pop music such that the first one is for live performance as the second one is for studio recording.

These factors are closely related to the way people listen to music and the kind of media they prefer, as the resurgence of vinyl records recently hints. Most of classical music listeners quitted using vinyl media and joined digital formats promptly, they are not among those who claim the return of the old analog format of recording on vinyl. On the other hand, in the last years, the number of new releases of pop music in vinyl has greatly increased although this audience also listens to all kinds of digital recordings. Considering these issues, this article aims to show how the relationship between listeners and both styles of music production are related; and how the "noise" is incorporated to the listening, as it points to the preference for a particular type of media. Perception theories recent concepts and the musical ecology are evoked in order to investigate the interaction between the listeners, the recorded music, noise and environment.

**Yuri Behr Kimizuka** is a composer, conductor and researcher, and has recently completed a MSc. in Musicology in the course about George Crumb's Makrokosmos ("Time: difference and repetition in the George Crumb's Makrokosmos") in the Music Department at UDESC, Santa Catarina State University - Brazil. His research interests also include studies of time, recording analysis, and live electronics performance. The researcher experience also includes writing and presenting his papers, and attending to the major Brazilian congresses. His current research investigates the subject "The idiosyncrasy between original productions for vinyl records and its reissues on digital media".

## Relative salience in polyphonic stimuli

**Background:** Music is often composed of different streams defined by different perceptual parameters. The phenomenon of auditory streaming has been studied in terms of gestalt (Bregman, 1990), of pitch (Dowling, 1973, van Noorden 1975), of duration (van Noorden, 1975), of timbre (Bregman & Pinker, 1978; Marozeau et al., 2013), and of loudness (Beauvois & McAdams, 1996). Recently, computational models have been developed in order to predict the components of the melodic phrase (e.g. IDyOM model Pearce & Wiggins, 2006). The present experiment takes into account all these studies in order to enlarge their perspectives by applying them to a polyphonic context. **Aims:** The experiment seeks to examine the effect of four different musical features (harmony, melody, timbre, rhythm) on the segregation of a target melody, in order to map the relative perceptual salience of these features from a musical perspective which can be used to improve IDyOM model predictions.

**Method:** In testing both musicians and non-musicians, participants will be asked to report whether the last two notes of the target melody are an increasing or decreasing interval. This target melody will be “hidden” amongst masking lines (Marozeau et al., 2013) that will systematically and independently vary on three levels of complexity for pitch, harmonic progression, rhythmic duration and timbre. With this task, we will be able to map the relative salience of our four selected musical parameters. The musical excerpts will be created with an equal number of parametric elements (i.e. pitches, harmonic species, rhythmical durations, instrumental timbres, voices), and all of them follow the principles of tonality and functional harmony. Data collection June 2015.

**Results:** The expected results will support the hypothesis that higher parameter complexity will result in higher difficulty in completing the task and is expected to be different for each parameter. Moreover, the importance of musical training in melodic segregation has been already demonstrated (Marozeau et al. 2013) and the present study is likely to corroborate these results, with higher accuracy and lower thresholds in musicians.

**Marco Bussi** has a strong musical background as he is an active pianist and composer with a particular interest in XXth century music. His main musicological interests concern: Music Theories, Compositional Techniques, Musical Aesthetic. His recent works and activities include several concerts and recordings and also the composition of original musical works.

He got in contact with music psychology in 2011 when he attended several conferences on music cognition as well as on music therapy. In 2013 he also attended some courses on psychology of music at the University of Padova and took part in the writing of a bachelor's experimental thesis on cognitive psychology. Currently he is serving an internship at the Music Cognition Lab of the Queen Mary University of London, where he is working on two different research projects related to Auditory Scene Analysis and Music and Emotions.

## Music & Cognition

Chia-Han Yeh | National Taiwan University

### **Neural Responses to Popular Heartbreak Songs and to Rock Songs: An fMRI Study**

Pop music is an essential part of modern life for many people. While heartbreak songs and rock songs, both distinct song types within the pop music genre, share a common musical structure in terms of verse-chorus form, these two song types impact listeners differently. A recent study found that listening to heartbreak songs elicits listener's relaxation response after the first chorus. The present study thus demarcated heartbreak songs and rock songs into two parts: the first verse-chorus progression and after the first chorus. We used fMRI (functional Magnetic Resonance Imaging) to explore the neural responses of 13 listeners to these two parts for two heartbreak songs and two rock songs. The right orbitofrontal cortex of participants showed significantly more activity during the second part of the heartbreak songs than during the first part. This region of the brain has been previously implicated in reappraisal and down-regulation of negative emotions. Moreover, the rock songs exhibited a significantly greater activation effect on the bilateral medial orbitofrontal cortices, which have previously been implicated in self-evaluation. The findings of the present study provide preliminary evidence that subregions of the orbitofrontal cortex mediate different aspects of cognition-emotion interactions while listening to pop songs.

**Valerie Chia-Han Yeh**, Graduate Institute of Musicology, National Taiwan University, Taiwan. Research interests: Biomusicology, Neuroesthetics. Education: 2014 B. Science in department of psychology B. Social science in department of music

**Chia-Wei Li**, Department of Electrical Engineering, National Taiwan University, Taiwan Research interests: Neuroscience, Cerebellum, Functional MRI, EEG. Education: 2006, M.S., Department of Electrical Engineering, National Taiwan University, Taiwan. 2006, Ph.D. student, Department of Electrical Engineering, National Taiwan University, Taiwan

**Chen-Gia Tsai**, Associated professor, Graduate Institute of Musicology, Ctr. for Neurobiology and Cognitive Science, National Taiwan University, Taiwan. Research Interests: Biomusicology, Neuroesthetics, Music Acoustics, Arts and Medicine. Education: 2004, PhD., Musikwissenschaft, Humboldt-Universität zu Berlin



Sarah Sauvé | Queen Mary University of London  
**The effects of musical training on auditory grouping**

Background: Auditory streaming is a process highly relevant to analyzing everyday sound environments, particularly with respect to timbre. The phenomenon of auditory streaming has a history of being studied in terms of Gestalt principles (Bregman, 1990), of pitch (van Noorden, 1975), of tempo (Bregman & Campbell, 1971), and of timbre (Bregman & Pinker, 1978; Marozeau et al., 2013). All of these parameters influence the extent of auditory streaming in various ways. An increase in performance in many types of auditory tasks is seen in musicians, including streaming (Zendel & Alain, 2008), presumably a result of training and brain plasticity.

Aims: This set of three experiments, building on previous work, seeks to corroborate this observed effect of musical training, and further define the effects of training on specific instruments.

Method: Experiment 1: In a simple ABA-paradigm where timbre is manipulated, various instrumentalists will identify a change in rhythm (triplet to 'straight' and vice versa) that will define their perceptual fission boundary (van Noorden, 1975). Data collection May 2015. Experiment 2: Musicians and non-musicians will be asked to indicate which rhythmic pattern (triplet or 'straight') is originally perceived for each trial, composed of static ABA-sequences (no manipulations) where the A and B timbres are maximally different. Data collection under way. Experiment 3: Flautists and violinists will participate in an interleaved melody paradigm (Dowling, 1973) where they are to detect a 50 cent mistuning, placed in either the flute or the violin melody. Data collection under way. In experiments 1 & 2, participants will be exposed to trials via Max/MSP, and responses will be collected in the same patch. Experiment 3 is conducted online, via Qualtrics survey software.

Results: It is expected that fission boundaries in Experiment 1 will be lower for an instrumentalists' specific timbre, demonstrating earlier detection, and therefore heightened sensitivity to their own instrument's timbre. Experiment 2 challenges the premise that integration is the default percept in auditory scene analysis (Bregman, 1990). Preliminary results indicate that the default percept when timbres are maximally different is instead segregation and that it depends on the perceptual distance between the two timbres involved. In Experiment 3, it is expected that flautists will identify mistunings more accurately and in more difficult conditions (pitch overlap) in the flute line than in the violin line, and similarly for violinists with the violin line.

With a B. Mus Hon from Memorial University of Newfoundland and an M.Sc. in Music, Mind and Brain from Goldsmiths University of London under her belt, **Sarah Sauvé** is currently finishing her first year as a PhD student at Queen Mary University of London with Dr. Marcus Pearce. Her research interests are around the themes of musical training, timbre, time perception, and expectation in music to name a few. Outside of research, she enjoys cycling, tea, playing the piano, and volunteering at a cat shelter and for CISV, an international organization working in peace education through local, national and international programmes.

## Perception & Action

Diana Kayser | University of Oslo

### **Studying Facial Expressions in Reaction to Music**

**Background:** A considerable amount of studies that focus on music and emotion exist today, but many of them are purely subjective and rely on self-reporting. This method leads to a delay between perception of the stimulus and report of the experience. The participants have time to reflect and interpret their experience, which in my view is problematic, since music, and its perception and subjective experience, are continuous and developing. In addition, words and concepts differ between individuals, which makes this approach unstable. Other studies are more objective and work with physical measurement (e.g., pulse, skin conductance), and often collect additional data through questionnaires or interviews. Marc Leman calls these methods First-Person Descriptions (subjective) and Third-Person Descriptions (objective).

**Aim and Method:** The aim of my study is to investigate facial expressions in reaction to self-selected music. Participants will be asked to bring music that makes them "happy" or „sad." During the experiment, they will be recorded with a video camera at 50-300fps. In addition, skinconductance and/or pulse will be measured in order to get additional data as well as to serve as a cover story for participants, since the participants' attention should not be on the camera. The collected data will be analyzed with the help of video-magnification software. Attention will be on the face and specifically on the so-called action units, which are defined for the specific emotions, further described in the Facial Action Coding System (FACS) by Paul Ekman. I chose this method of Second-Person Description because it provides continuous real-time information about the emotional state of the participant. Ideally, information about perception of emotion in music can be gathered. Since facial expressions in connection with basic emotions are considered to be universal, this method can lead to more reliable information than self-report.

**Results:** A pilot study is planned and I hope to be able to present some preliminary results showing if and how facial expressions change in reaction to the presented music and if there is any correlation with data which additionally will be gathered (skinconductance, pulse, self-report).

**Diana Kayser** is enrolled in the Master's programme at the Institute of Musicology at the University of Oslo, Norway. She also is a part of the interdisciplinary fourMs - Music, Mind, Motion, Machines research group at the Institute of Musicology. Studying the interdisciplinary field of music psychology, her main interest is in the study of music and emotions and music perception. Her focus particularly lies on

the measurement of the reaction to music on a subconscious level. In her Master's thesis she will investigate how emotion in music is related to facial expressions of the listener. Diana Kayser received her Bachelor's degree in 2013 from the University of Cologne, Germany.

Gina Emerson | Humboldt-University of Berlin

**Gesture-sound causality from the audience's perspective: investigating the influence of mapping design on the reception of new digital musical instruments**

In contrast to their traditional, acoustic counterparts, digital musical instruments (DMIs) rarely feature a clear, causal relationship between the performer's actions and the sounds produced. Instead, they often function simply as controllers, triggering sounds that are or have been synthesised elsewhere; they are not necessarily sources of sound in themselves (Miranda and Wanderley 2006). Consequently, the performer's physical interaction with the device frequently does not appear to correlate directly with the sonic output, thus making it difficult for spectators to discern how gestures and actions are translated into sounds. This relationship between input and output is determined by the mapping, the term for the process of establishing relationships of cause and effect between the control and sound generation elements of the instrument (Hunt et al. 2003). While there has been much consideration of the creative and expressive potential of mapping from the perspective of the performer and/or instrument designer, there has been little focus on the experience of those receiving DMIs. How do spectators respond to the perceptual challenge DMIs present them? Is the lack of gesture-sound causality viewed positively or negatively? Drawing on existing work from the areas of audiovisual music perception research and new musical instrument design, this paper will present the results of an empirical study to be undertaken within the 3DMIN (Design, Development and Dissemination of New Musical Instruments) project at the Technical University, Berlin. Following on from a preliminary qualitative investigation carried out at a 3DMIN concert in February 2015, an experiment will be developed to isolate the influence of differing degrees of input-output causality on the spectator's reception of the instrument. The results will provide useful feedback to those designing contemporary musical instruments and should offer an extension of existing work on audiovisual congruency and causality in music perception.

**Gina Emerson** is a Master's student in Musicology at the Humboldt University in Berlin, specialising in music psychology and music sociology. She completed her undergraduate degree in Music at the University of Oxford in 2013. Her master's thesis, which is part of the 3DMIN research project at the Technical University in Berlin, explores the reception of new digital musical instruments. Other research interests include cross-modal music perception and emotional responses to music.

## Ethnological Perspectives

Maja Preitz | Martin Luther University of Halle-Wittenberg

### **The Buddhist Monk as a Musician – Manifestation of the social system within the Tibetan monastic community through music**

Music is an integral part of Tibetan Buddhist rituals. But moreover than forming the structure of the ritual with its rich symbolisms, it also indicates the position of the monks within the monastic hierarchy. All ritual acts are conducted by a high ranking priest. He is the master of the ceremony (*dbu mdzad*). Furthermore every ceremony needs a master of music (*rol dpon*) and the fact that often both functions are performed by the same person already shows the significance of conducting the ritualistic music. The Tibetan Buddhist ritual is distinguished by an alternation of recitation, chanting and instrumental music. The master of music always starts the chanting and usually plays the cymbals. The beginning and end of the orchestral interlude depend on this play. Although quality and sonority of his voice are important factors he is characterized by an extensive knowledge of the ceremony which also marks his position within the monastery. Certain instruments indicate specific social positions, but it is not due to the difficulty in playing one or another instrument. The instruments rather mark the position of their players by their immanent symbolisms that are tied to the Buddhist teachings and metaphoric references. The social system that constitutes itself through following mutual religious rules and the communication about Buddhist teachings reveals itself inter alia through musical interaction. This musical communication exists on a sonorous level on the one hand and a symbolic level of the instruments on the other. Being comprehensive to the various lineages of Tibetan Buddhism these social and ritualistic structures have grown over a millennium.

**Maja Preitz** has completed her Master's Degree in Musicology at the Martin-Luther-Universität Halle-Wittenberg. Prior to doing her B.A. in Music and Media at the Humboldt-Universität in Berlin, she studied Film Studies at the Freie Universität Berlin. During her master studies she worked for the Max Planck Institute for Social Anthropology and Professor Schwörer-Kohl at the Institute for Music as a student assistant. After finishing her Master's Degree she worked freelance in the music industry and is currently preparing her Ph.D. Her research interest focuses on the musical culture in Tibet respectively regions that are shaped by Tibetan Buddhism (Ladakh, Bhutan etc.). For her thesis she went on a field trip to Ladakh for research on monastic mask dances called '*cham*'. Last Year in October she presented her research at the 4th Conference of the Carl Stumpf Gesellschaft of which the transcript is in press.

**Vocal acoustic semiotics in western/westernized pop singing through  
the example of K-Pop**

My presentation analytically explores sound phenomenology and emotive effects of singing in contemporary pop music. Pop music is considered a communication system constituted by an informational link between transmitters (producers) and a receiver (the listener). It allows the intentional transmission of information regarding real or fictitious emotional states from the former to the latter. Though this transmission can be accomplished via different semantic dimensions (song text, song tonality, tempo, instrumentation, performances, visualisations, fashion, or narrations linked to the interpreters), the presentation focuses on the medium of vocal acoustics – the acoustic qualities of a singing voice effected by the human vocal apparatus and its mechanisms (respiration, phonation, articulation), as well as technical possibilities of voice manipulation. These acoustic voice qualities which are wilfully produced within a framework of communication in order to perform a paraverbal action that encodes a certain message regarding emotional states to the receiver, are referred to as signs. Thus the aim of my presentation is to describe and to systematize these vocal acoustic signs. The first group of vocal acoustic signs – biogenic signs – is associated with biological processes or circumstances and includes all of the voice qualities that derive from the human vocal apparatus. They are either analogically coded (i. e. they emphasize the resemblance to biological processes or circumstances and therefore serve as iconic signs – head or chest register, nasalization, glottalization) or coded according to a pars pro toto principle (i. e. they acoustically represent an overall organismic context and therefore are indexical signs – shaky voice, breath sounds, strained voice, surplus air, faucal constriction). The second group – technogenic signs – pertains to voice manipulation done in a sound studio. This group contains prosthetical-superioristic signs (by means of which a singing voice can exceed its physical limitations – pitch shifting, distortion, cutting techniques) and transhumanistic signs (by means of which a singing voice divests itself of human qualities – auto tuner, vocoder, speech synthesis).

All my remarks are underpinned by excerpts of recent K-Pop tracks. This variety of pop music from South Korea is commonly regarded as paradigmatic due to the fact that it is produced for the purpose of international marketing and its sheer popularity. Even though the presentation is centered on pop music, it resorts to communication theory, media science, bio- and evolutionary musicology, musical semiotics, musical socialization theory, applied technology studies as well as cultural history and science of the voice.

**Niklas Meier** (born 1989) is a sound researcher. He earned a master's degree in musicology at Leipzig University in 2014 and is currently doing Sound Studies at Berlin University of Arts where he has been granted the Rolf Julius Scholarship. His scientific interests cover the emotive effects of sound, notably of human vocal sounds produced within the scope of paraverbal communication, sound semiotics considering bio-/evolutionary musicology, and urban morphology in the context of sound as well as the interdependency of sound, space and social structures. Meier's technical and artistic works embrace the creation of custom audio software, the design of sonic user interfaces, and the processing of sound-unrelated data into acoustic events. His audio works are noticed internationally: His works have been performed at Invisible Places – Sounding Cities 2014 in Viseu/Portugal, ZimaFM 2015 in Ljubljana/Slovenia and Kurt Weill Fest 2014 in Dessau/Germany. Niklas Meier has lived and worked in Leipzig and is presently based in Berlin.

Michael Blaß, Tim Ziemer | University of Hamburg  
**Blowing pressure dependent synchronization in the Zummâra**

This paper discusses the influence of blowing pressure changes on the reeds of the Zummâra abâuia. The Zummâra is a double clarinet consisting of two parallel and firmly connected pipes, each with four symmetrically placed finger holes. The instrument is idioglottal, meaning the reeds are cut from the tube. When blown at pressure levels below a certain threshold both pipes produce the same pitch. Exceedance of this threshold results in a sudden pitch shift. Each pipe then produces its own pitch, one below the low pressure pitch and one above it. Since the pitch of the pipes depends on the reeds, their excitation behavior and the radiated sound was analyzed. In order to compare each state of behavior an experiment was set up to record the reed motion and the sound radiation simultaneously. We utilized a high-speed camera to track the reeds and make their motion visible. Sound was recorded using a microphone array of eight omnidirectional microphones, one for each finger hole. Analysis was based on a 3.7 s record comprising one sudden pitch shift. The high-speed recording shows that the onsets of both pipes are simultaneous. Spectral analysis of the low pressure state reveals harmonic spectra of the reed motion and the radiated sound, each with a fundamental of approximately 630 Hz. Above threshold each pipe has its own fundamental of 604 Hz and 651 Hz respectively. Obviously the Zummâra allows for two distinct regimes: a unisono and a detuned regime, with the latter being culturally desired. The transition between the regimes is controlled by blowing pressure.

**Michael Blaß** studied historical and systematic musicology in Saarbrücken and Hamburg. Currently he is a research assistant and doctoral student at the Institut of Systematic Musicology Hamburg. His dissertation deals with stochastic rhythm representations, rhythm similarity models and ethnographic music databases. He is mainly interested in signal processing, music information retrieval and musical instruments. Marie Hoffmann (Humboldt-University of Berlin): Ensemble interaction in a roda de samba: musical knowledge and social aspects

Contributing to the field of ensemble interaction, this research explores the interactive processes of performance in a case of Non-Western popular music: samba. The musicians of a roda de samba (sitting in a circle (roda)) perform from memory, as there are no music scores in samba. They also perform without rehearsals, and with spontaneous musical alterations as well as spontaneously changing musicians. But how do they interact to create their performance? Which channels of interaction and communication do they use to transmit information with which effects?

Data collected from different rodas, including observations, recordings and extensive interviews with all musicians, provides understanding of the multi-modal information-sharing processes. Information can be shared on a verbal, gestural, visual and/or auditive level, the visual and auditive ones are mostly being used. The study shows for example how musical authority is distributed, to which degree the musicians can unfold creativity, how they accompany an unknown samba and in which way interaction changes when performing with other musicians. For all of those processes the musicians refer to their musical knowledge to interact with their instruments and with each other. The musical knowledge system is mainly based upon embodied knowledge acquired mostly in informal learning contexts and experiences in ensemble performance. Social and interpersonal aspects (such as friendship and intimacy) seem to be more important than a perfect musical performance, i. e. roda de samba represents a highly participative musical practice. The research findings suggest considering the forms of interaction as defining characteristics of a roda de samba. The present study provides insights in the operation of ensemble interaction and discloses the correlations between the sociocultural context of a musical practice on the one hand and forms of musical interaction and embodied knowledge on the other.

**Marie Hoffmann** is currently finishing her Master in musicology at Humboldt-Universität of Berlin. She previously completed her BA in Music and Media at the same university, majoring in Music with Cultural Science as second subject. During her Bachelor she studied for one year at Universidade Federal Fluminense in Niterói, Brazil, and came back to Rio de Janeiro in 2014 to study at the School of Music of Universidade Federal do Rio de Janeiro, engaging in research and fieldwork for her Master's thesis on ensemble interaction in a roda de samba. Her main areas of interest are forms of musical interaction, musical learning processes and social effects of music-making.

## Rehearsal & Performance

Raquel Rohr | Federal University of Minas Gerais, Belo Horizonte

### **A historical outline of Cello performance in Brazilian Popular Music**

Among orchestral strings, the violin - as a soloist instrument - and the double bass - as an accompaniment instrument - have been used very frequently throughout the history of Brazilian popular music since its emergence in the late nineteenth century. On the other hand, the cello has had a more limited and conservative participation in popular genres, usually restricted to being a member of orchestras and small chamber groups. However, scattered incursions of the cello as both a soloist and an accompanying instrument in the last three decades is observed in more sophisticated instrumentations in the music of icons such as Tom Jobim, Egberto Gismonti and others. The present study aims at outlining the emergence, diversification and consolidation of the cello in the context of Brazilian popular music, especially in the genres of samba and bossa nova, departing from structured interviews with cellists and a survey of LPs, CDs and DVDs and non-commercial recordings.

**Raquel Rohr** is a doctoral student, Master and Bachelor of Music Performance from the Federal University of Minas Gerais (UFMG). Cellist and researcher linked to the Federal University of Juiz de Fora, conducts research in the areas of Performance, Popular Music and Musicology. Between 2007 and 2014 she taught cello at the Music School of the Espírito Santo (FAMES), where she developed extension projects in the area of pedagogy of strings and orchestral practice. In performance field, between 2007 and 2014 she integrated the Symphony Orchestra of the Espírito Santo (OSES). Currently, she joined the orchestra of the UFJF music department and the COMUS string trio, which develops research on application of expanded techniques in the performance of Brazilian popular music. His doctoral research is funded by the Fundação de Amparo à Pesquisa do Espírito Santo (Fapes).



Davi Mota, Tairone Nunes Magalhaes, Aluizio Oliveira, & Maurício Loureiro  
Federal University of Minas Gerais, Belo Horizonte

### **Characterization of vibrato and bending in performances on the electric guitar**

On the electric guitar, vibrato and bending are techniques that, according to common sense, play a key role in a guitarist's playing signature. This work aims at investigating features of vibratos and bendings that most differentiate one guitarist from another. Moreover, we propose a framework for the categorization of playing styles based on these techniques. The proposed framework is composed by four stages: (1) pitch extraction; (2) segmentation into note onsets and offsets; (3) extraction of multidimensional descriptors for bending and vibrato; (4) analysis and categorization of performances based on the proposed parameterization. Pitch extraction was based on harmonic energy. Note onsets and offsets were detected using RMS energy, pitch and noisiness curves. Vibrato rate and extension were estimated by recurrence of peaks in the pitch curve. Dimensions for our vibrato descriptor include: mean, minimum and maximum values and standard deviation of rate and extension; time to reach the maximum vibrato extension, etc. Dimensions for our bending descriptor comprise: average and instantaneous bending speed, temporal pitch centroid, among others. In order to validate the model, we applied k-means to the data extracted from a set of several performances of two short musical excerpts, performed by 8 guitarists of distinct expertise. The excerpts contained multiple vibratos and bendings of different characteristics. We were able to show that this set of features is reliable for the characterization of guitarists' performance signatures, since the model was capable of discriminating different musicians into different performance style categories. These preliminary results show us potential venues for exploring acoustical descriptions of expressiveness focused on musical gestures of genres such as blues and rock and roll.

**Davi Mota** (CEGeME — Center for Research on Gesture, Music & Expression, Universidade Federal de Minas Gerais (UFMG) — Belo Horizonte, Brazil) has a bachelor in music (conducting, UFMG, Brazil 2010) and a master in Sonology (UFMG, Brazil, 2012). Since 2013 Davi works as a doctoral researcher at the Music School of UFMG focusing on the analysis of musical performance. He is an active member of several research groups such as CEGeME - Center for Research on Gesture, Music & Expression; CEFALA - Center for Research on Speech, Acoustics & Language; and CEMECH - Center for Research on Movement, Expression and Human Behavior. With main interests in musical acoustics, music information retrieval, musical gesture and musical ensemble performance.

### **Music rehearsals and well-being**

Several studies have reported positive effects of (choral) singing on well-being (e.g. Beck et al., 2000; Unwin et al., 2002; Kreutz et al. 2004; Clift et al. 2009), mostly by comparison to a listening condition. There is, however, a lack of literature addressing the comparison of choral singing with other active music-making conditions.

This study compares the effect of choral singing, playing in a brass band, playing in a theater group, and passive music listening on well-being. Participants were three choirs (n = 57, 44 female, mean age 59.7 yrs), two brass bands (n = 54, 20 female, mean age 34.1 yrs), three theater groups (n = 34, 21 female, mean age 32.1 yrs) and a group of concert-goers (n = 37, 27 female, mean age 46.4 yrs). All participants completed the Positive Negative Affect Schedule (PANAS), the Perceived Stress Questionnaire (PSQ) and the State-Trait-Anxiety-Inventory (STAI; state questionnaire only) before and after a 1.5-hour rehearsal (or concert). They then answered a series of open questions in writing (e.g. importance of singing/playing in this group; satisfaction with their own performance in rehearsal) after the session (or concert). Separate interviews were conducted with three to five participants in each condition.

The results show a significant decrease of negative affect between pre- and post- measurements for all four conditions. A significant decrease in PSQ ratings was found for the choir, theater and concert conditions, but there was no significant change for the brass band. State anxiety significantly decreased in the choir, theater and concert conditions and significantly increased in the brass band condition.

Choral singing (as shown in previous studies), playing in a theater group and listening to music was found to have a positive effect on well-being. The qualitative data is currently being analyzed; findings may explain the lack of positive effect in the brass band condition.

**Eva Matlschweiger** has been studying Musicology, focusing on Music Psychology, in Graz since 2007. During this time she spent two semesters on exchange, one in Fayetteville, Arkansas, USA, the other one in Uppsala, Sweden. Her research on choral singing and well-being began with a theoretical Bachelor's thesis. Her SysMus presentation is based on her Master's thesis. Matlschweiger also studied choral conducting at the University of Music and Performing Arts in Graz and at the conservatory in Graz. She has been singing in various choirs and ensembles since early childhood and conducts a choir, which she founded in 2006.

**The consistency of continuous ratings and retrospective overall judgements  
for live performances**

Judgement of performances is a common task in educational contexts or competitions. Yet few studies have investigated how reliable these judgements are and how they are made over time while listening. Either the time aspect has been excluded (e. g. Davidson & da Costa Coimbra, 2001) or when continuous response data has been collected the stimuli were recordings instead of actual live performances (e. g. Thompson, Williamon & Valentine, 2007). This study aims to find patterns in how the judgements are made over time and in how far different raters agree on how good a performance is, as well in realtime as for the overall evaluations. 27 subjects rated five musical performances in a students' recital at university. Both continuous and retrospective ratings have been collected on iPads using emoTouch software and a short questionnaire displayed within the application was answered after each piece of music. All performances have been recorded on video. While individual ratings differ a lot for some of the performances, inter-rater correlations and reliability are high. This can probably be explained by a different use of the rating scale. Most of the time a plausible interpretation of the relation between mean ratings of all participants over time and the performance recordings can be made. Overall judgements correlate highly with the mean ratings over time, with the combination of peak and end rating, which have been shown to be of special importance in continuous response studies, e. g. on emotional experiences (Fredrickson & Kahneman, 1993), and also with most other episodes of the performances, even very short ones. A decision for one model as the best predictor for the retrospective ratings can only be made for theory-based reasons, as the correlation coefficients differ too little.

**Carolyn Scholle** studies Music Education and Mathematics for her Master's degree at the University of Osnabrück. She received her B. A. in Musicology and Mathematics from the same university and studied Music as a visiting student at the University College Cork for one semester. For her Bachelor's thesis she started developing the continuous response application emoTouch for iPad and has continued with improving it until now as a research assistant for the chair for Systematic Musicology under supervision of Prof. Christoph Louven. Her research interests are performance studies, especially performance evaluation and music and emotion.

## Rhythm & Synchronisation

Esther Coorevits | IPEM, Ghent University

### **Synchronization in ensemble performance: the sniff as a temporal cue**

Ensemble performance requires a fine-grained temporal control of body movements in order for musicians to coordinate their actions and to align musical expression. The synchronization of tone onsets is an essential aspect of this alignment. Musicians use different strategies to start and keep playing together, including counting, explicit gestural cues (like the time beating of a conductor in front of the ensemble) or sniffing. The latter method is often used to indicate the beginning of a phrase or sudden tempo changes, especially when musicians are not able to see each other, where it functions as a kind of sonification of a visual cue. Though the sniff is commonly used and appears to be a successful method to synchronize onsets in music performance, to our knowledge, it has not been studied from a systematic-empirical point of view. With this study, we want to gain insight in the practice of sniffing as a method of synchronization and compare it with conducting gestures. 20 couples of experienced musicians participated in an experiment in which they indicated onsets by sniffing, without visual contact, and then clapped together following instructions on a screen. Prescribed actions included both single, isolated claps and simple rhythmic patterns in three different meters (2/4, 3/4, 6/8) and three different tempi (fast, medium, slow). The results show that indicating onsets with a single sniff is fairly successful, and that the person giving the cue mostly tends to precede the co-performer in timing. To compare the results with a conducting gesture, 4 conductors were asked to perform an upbeat (anacrusis) movement in the three different meters and tempi and their movement was registered with an accelerometer. Preliminary results show that the timing and shape of the conducting gestures are related to the practice of sniffing in ensemble performance.

**Esther Coorevits** obtained her Masters in Art Sciences at Ghent University in 2013. Currently, she is a PhD researcher at IPEM – Institute for Psychoacoustics and Electronic Music. Her research focuses on expressive timing and entrainment in music performance and embodied music cognition. Next to her PhD-research, she is active as a musician in several orchestras and bands.

#### Publications

- Coorevits, E., & Moelants, D. (2014). "Tempo in Baroque music and dance." In M. K. Song (Ed.), Proceedings of the ICMPC-APSCOM 2014 Joint Conference (pp. 12–18). Presented at ICMPC-APSCOM - 2014, College of Music, Yonsei University, Seoul, Korea.
- Visi, F., Coorevits, E., Miranda, E. R., & Leman, M. (2014). "Effects of different bow stroke styles on body movements of a viola player: an exploratory study." In A. Georgaki & G. Kouroupetroglou (Eds.), Proceedings of the ICMC-SMC 2014 joint conference (pp. 1368–1374). Presented at ICMC-SMC-2014, National and Kapodistrian University of Athens, Athens, Greece.
- Coorevits, E., Moelants, D., Maes, P.J., Leman, M. (2014). "Studying the effect of tempo on music performance: a multimodal approach." In: 9th Conference on Interdisciplinary Musicology CIM14, Berlin.

## **Synchronization of movement and gestural communication in Jazz improvisation**

The term entrainment is already established in a lot of disciplines that work on human interaction and communication. In its pure and original meaning it describes the phenomenon of the assimilation of frequencies or waves in general. In human interaction especially in linguistic studies, the adaption of timbre, syntax and body movements shows entrainment.

In music research entrainment became an increasingly important theory to deal with the phenomena of micro timing and especially in research about groove (Doffmann 2008). Our research wants to point on another aspect of entrainment: Interaction. Musicians communicate and interact while playing music. Especially in improvisation, the aspect of communication and the question of turn taking is important. Thus we want to find out whether through movement synchronization (entrainment) gestures arise that musicians use to communicate with each other. The setting of our study consists of a jazz trio (piano, double bass, drums) that plays together without rehearsal or further arrangements. The idea of a jazz jam session and the interplay for the first time should support the idea of communication through gestures. The session was recorded by video camera and VICON Motion capture system. In video analysis the synchronization of head movements of the three musicians was asserted. In some selected parts this finding will be proved by motion capture data analysis.

The aim of this research is to show how musical interaction works in musical improvisation processes. As changes of instrumentation and turn taking in general are not noted on a piece of paper that helps musicians to orientate, decisions about the musical progress have to come from the musicians during the spontaneous musical process. This study wants to explore how this interaction works on the gesture level and especially on a level that also includes ideas of groove and unintentional actions. We suppose that entrainment helps the musicians to play together in time. The movements one musician can see on his teammates' bodies help him to interpret the ideas the others want to represent. This allows direct interaction with the other musicians.

**Patrick Becker** was born in 1993 in Dortmund, Germany. At the age of twelve, he started to play clarinet and short after commenced to study organ and piano. He studies Musicology, German Literature, Philosophy and Indo-European-Studies at Humboldt-University, Berlin. In this Jazz improvisation study, he used Matlab to analyse and visualise the data that was collected with the VICON Motion capture system. At the moment he is working on his graduation thesis that will deal with the implementation of the fugue concept in the literary work of the Berliner expressionist artist Otto Nebel.

**Lisa Krüger** studied her Bachelor „Kunst, Musik, Medien“ (art history, musicology and media science) in Marburg, Germany and Groningen, Netherlands. Soon she decided to focus on music as her main topic of interest and research. Beside her work as a project manager for various music festivals and music institutions she studies her Master of Musicology at Humboldt-University, Berlin. Since the beginning of her master studies she gained expertise in different systematic approaches to jazz studies focusing on performance research.

## Music & Interaction

Alessandro Miani | Aarhus University

### **The social neurochemistry of music as a tool for courtship: cooperation or competition?**

Is music just a cheesecake (Pinker, 1997)? For Darwin, music offers a means to impress females (Darwin, 1859; Miller, 2000a; Mithen, 2005; Levitin, 2006; for an opponent view see Fitch, 2006), while others highlighted its role in group cohesion (Cross, 1999), which arose from the capacity to entrain rhythm (Patel, 2014), reading the mind (Livingstone & Thompson, 2009), or from mother–infant interactions (Falk, 2004; Disanayake, 2009). In this talk, the debate will be faced by putting forward a courtship model based on the new-born field of the neurochemistry of music (Chanda & Levity, 2013), considering the dynamic and contextual relationship between oxytocin, cortisol, and testosterone, i.e., cooperation (Kirsch et al., 2005; Kosfeld et al., 2005; Domes et al., 2007), social stress (Seeman et al., 1995; Peters et al., 1998), and sexual drive (Dabbs & Mohammed, 1992; Nelson & Chiavegatto, 2001; Archer, 2006).

Endogenous oxytocin is released during singing (Grape et al., 2003), while exogenous administration promotes rhythmic synchronization (Gebauer et al., 2014). Cortisol is related to music rhythmicity (Mockel et al., 1994): it rises with activating music and falls with the relaxing one (Gerra et al., 1998; Nilsson et al., 2005); it decreases in women and increases in men, depending on performance and rehearsal, with higher levels for the first (Grape et al., 2003). A similar gender effect, in relation to music listening, has been also traced for testosterone, which increases in women, and decreases in men (Fukui, 2001; Fukui & Yamashita, 2003).

Courtship is for many mammals a male affair (Miller, 2000b; Buss, 2008). In regard to humans, men's cortisol rises after a brief social contact with an attractive woman (van der Meij et al., 2010) but when she flirts with him it remains stable while testosterone increases (Roney et al., 2007). Given this hormonal fluctuation, I suggest a two-stage model for courtship (reflected by levels of cortisol and testosterone respectively), wherein music lays on the first one. Competition and cooperation in music are not mutually exclusive: during music performances and dance, males cooperate in order to impress females, but they do cooperate for the individual sake, which is basically how other great apes join in shared actions (Tomasello, 2014). Thus, making music together is paradoxically both a cooperative and an exploitative strategy to increase the best performer's chance to mate.

Holding a BA in Musicology (University of Udine) and a MA in Communication Sciences (University of Modena and Reggio Emilia), **Alessandro Miani** is currently a Master student in Cognitive Semiotics (Aarhus University). His primary research interests were focused on the relationship between syntax and semantics in both language and music. Being different aspects of the same communicative phenomenon and having surprising structural similarities, he thought they mainly differ on the pragmatic level (acting as a syntactic/semantic interface), leading his attention to locate an evolutionary cause for their separation. Thus, he is now also fascinated by animal cognition and behavior as well as evolutionary biology, psychology, and neuroscience. On these topics he already published few papers and participated to conferences in Lithuania, Germany, Spain, and UK; next important events will be SMPC in Nashville and Protolang in Rome, as well as the summer course in Tübingen with Michael Tomasello on human cooperation.

Liubou Pazniakova | IPEM, Ghent University

### **The influence of tempo, modality, expertise and movement on conductor-musician synchronisation**

Temporal coordination and expressivity are the essential constituents of the communication between a conductor and ensemble musicians. These aspects have been of high interest and mainly studied from a conductor perspective; namely physical parameters of conducting gestures or their effect on observers' evaluation of musical expressivity have been explored. In the current study, we investigated four additional factors for their influence on human's sensitivity to the musical beat and tempo communicated by a conductor; namely experience in performing under the lead of a conductor, the ability to move along with the conductor, modality of information, and tempo. We applied a non-repeated measures sensorimotor paradigm, based on a beat synchronisation task. A controlled design, quantitative measures, and ecologically valid auditory and visual stimuli were used. Participants (non-musicians, musicians, and musicians experienced in performing under the direction of a conductor) had to press a button to identify a musical beat by (1) listening to a musical piece (auditory condition), (2) observing the conductor directing the musical piece (visual condition), and (3) listening to the music and looking at the conductor (audio-visual condition). Performing the task, participants had to either (1) move in a natural way along with the music and the conductor ('movement' condition) or (2) stand still ('no movement' condition) while pressing the button. The results showed that conductor-musician interaction mainly depends on such interconnected factors as experience, tempo, and modality of the beat. The ability to move along with the conductor did not significantly improve participants' beat synchronisation and tempo identification performance, which requires further research.

**Liubou Pazniakova** is currently doing her PhD in Art Science at Ghent University in Belgium. She previously finished Sollertinsky Vitebsk State College of Music in Belarus specialising in Choral Conducting. Then she completed her Specialist in Musical Art and the English Language at Masharov Vitebsk State University in Belarus. After that she completed her Master in Theory and Methods of Training and Education in the Field of Musical Art at the same university. Her Master's thesis was devoted to exciting students' interest in music by means of multimedia presentations. Her current research interests concern the communication between a conductor and ensemble musicians, expressive gestures, and musical timing.

Alana Blackburn | University of New England, Armidale  
**Creating Harmony: exploring the organisational factors of contemporary  
chamber music ensembles**

Chamber music ensembles are often used as a model for human social systems, in particular work organisations, to demonstrate the impact of internal dynamics between individuals when forming a cohesive team. Previous research has shown that musical groups including string quartets are frequently employed as the basis of such models due to the homogenous nature of their instruments and sound, and the understanding of technical similarities that can contribute comparable aspects of music making and teamwork. The formation of such ‘traditional’ ensembles since the Classical period has led to an ingrained hierarchy and a formal structure of leadership. The 20th and 21st centuries however, have brought about a development of more eclectic and experimental ensembles where the traditional roles of instruments and their players are somewhat distorted. As in any organisation, a perfectly formed team must learn to accept the differences, strengths and weaknesses of its members. A contemporary chamber music ensemble must also take into consideration the varied background, education and experience of its performers. By investigating teamwork and small group organisations, and comparing those methods to personal accounts of collaboration through focused interviews of experienced chamber musicians, this study reveals the key aspects of a successful working relationship within ensembles at both an artistic and administrative level, and conversely, how other organisations can learn from their creative collaborative processes. This includes the interpersonal relationships, motivation, leadership and decision-making methods today’s contemporary chamber music ensembles employ, and how they communicate their musical message to today’s audience through performance as a unified whole.

**Alana Blackburn** is currently a PhD student and casual lecturer of music at the University of New England (UNE) in Armidale NSW, Australia. Alana is a professional recorder player and teacher specialising in both early and contemporary repertoire. She has graduated with Bachelor and Master degrees in music performance from the Sydney and Amsterdam Conservatoriums. Alana’s professional career as a performer has seen her collaborate with a number of musicians in both historically informed and contemporary ensembles. She has recorded 3 CDs with Amsterdam-based The Royal Wind Music as well as featured on 2 CDs with Sydney group Salut! Baroque. Recent collaborations have included projects with sound technologist Benjamin Carey and Shakuhachi Grand Master Riley Lee. While Alana has published a number of articles on music and e-learning, her current research area is investigating musicians’ professional identity and collaborative methods of successful chamber music ensembles.



## Music & Emotions

Flemming Kristensen | University of Würzburg

### **The influence of parental support and the valuing of music on self-regulation/self-efficacy in young musicians**

Background: The importance of parental support and the valuing of music for young people's success in learning a musical instrument is thoroughly documented (Bloom, 1985; Davidson, 1996). Naturally there are other factors that significantly impact on musical development. McPherson & McCormick (2006) state that one's level of self-efficacy is the best predictor of success. Similarly, a high level of self-regulation leads to better results in the learning of a musical instrument. A theoretical framework that addresses the social environment directly is "persons in the shadow" (Gruber et al., 2008.). These social supporters (both parents and others) consistently monitor young persons and actively intervene in their development when necessary (Lehmann & Kristensen). Rarely, however, is their involvement appropriately attributed to a musician's success. Thus we hypothesize that the parental support of young musicians plays a far greater role in their musical development than currently accepted.

Method: Following a qualitative pilot-study, a questionnaire-survey was undertaken to measure self-regulation, self-efficacy, family support and the value of music in the family. For this purpose a number of measuring instruments were developed and modified. Our items for self-regulation and self-efficacy were based on those of Ritchie & Williamon (2011, 2013) and Miksza (2012). Of the 171 questionnaires that were distributed to instrumental pupils and their parents, 44% were completed and returned.

Results: The measuring instruments proved reliable (Cronbach's  $\alpha > .85$ ). Significant medium to large correlations were found between "Parental support", "Self-regulation", "Valuing of music" and other scales. The high-performing musicians were from families that valued music more highly and offered greater parental support. In this presentation the construction of the measuring instrument as well results from the path analysis will be discussed.

**Flemming Kristensen** (BMus Hons; M.A.) studied piano (1999-2002) under Katherine Austin at The University of Waikato, New Zealand. After completing his music education studies, he taught (2004-2006) music and German at secondary school level. In 2008 he moved to Germany to pursue his studies in the areas of instrumental pedagogy and musicology. In 2012 he completed his Masters in music pedagogy and music studies in Würzburg, Germany. His main area of interest, and current Phd research topic, focuses on the influence of environmental factors on the development of musical skills in young people.

## **Musical Judgements under Uncertainty: Am I Listening to the Same Song?**

In an attempt to apply Kahneman's framework (2011) to music psychology, we have designed an experimental paradigm to examine musical judgements under uncertainty. Similar to Behne (1987) and Durksen (1972), in this paradigm, participants were misled to think that they listened to three different interpretations of the same piece of music. However, they actually heard the same duplicated recording three times. Each time, the recording was accompanied with a short text inducing low, medium or high prestige of the musical performer.

The goal of the present study is to examine whether judgements in musical listening can be biased by non-musical clues such as information about the prestige of the performer (prestige effect), the presentation order (position effect), and the musicality of the participant (expertise effect). In a within-participants design, 72 participants (36 males, 36 females), aged 19-39 ( $M = 24,26$ ;  $SD = 3,59$ ), were instructed to listen to and evaluate musical interpretations with several objective and subjective ratings.

Most participants (84,72%) were prone to deceptions so they believed that they heard different musical recordings. Differences on the musical judgements showed a clear prestige and position effect. Participants evaluated the same recording significantly ( $p < .0005$ ) better in the high prestige condition than in the low and medium ones. On the other hand, when the recording was heard the first time, it was rated significantly lower ( $p < .05$ ) than the second and third time, which is in line with the established mere-exposure effect (Zajonc, 1968). Additionally, musicians were similarly affected by the prestige inducing texts compared to non-musicians.

Our findings reveal that musical judgements are not as objective and rational as one could expect. Only 11 out of 72 participants (15,27%) realized that they listened to the same recording three times repeatedly. This ground-breaking research speaks to how musical judgements are easily biased by an important number of extra-musical factors and may provide relevant insights to the study of musical preferences, musical behavior and aesthetic judgements.

**Manuel Anglada Tort** completed his degree in Psychology in Barcelona, Spain, where he worked as a research assistant in his university's department of psychology and had the opportunity to conduct several experiments in psycholinguistics. In order to study a research-based masters abroad, he spent one year working and studying English in Toronto, Canada. Although he had to turn down his music career a long time ago, he has always been an active musician, producing electronic music and playing the drums, piano and harmonica. Therefore, when he realized that he could fuse both of his true passions, music and research in psychology, he did not hesitate to decide that his future would be as a researcher in psychology of music. Currently, he is studying in the MSc in Music, Mind, and Brain at Goldsmiths, University of London.

Paul Elvers | Max Planck Institute for Empirical Aesthetics, Frankfurt/Main  
**Listening to Empowering Music – Music-Induced Manipulations of Self-Esteem**

Background: Music may not only elicit basic emotions but may mediate complex psychological states such as mixed emotions (Juslin, 2013), feelings of power (Hsu et al., 2014), or prosociality (Greitemeyer, 2011; Kirschner & Tomasello, 2010). Theories of musical affectivity have conceptualized these effects as being based upon »embodied empathy« (Clarke, 2014), »co-pathy« (Koelsch, 2013), or »Einführung« (Lipps, 1906; Vischer, 1887), which posit music as being able to mediate psychological states and by doing so, organizing human subjectivity. By using music for mood- regulation (Saarikallio & Erkkila, 2007), self-development (DeNora, 1999, 2000), and wellbeing (Macdonald, Kreutz, & Mitchell, 2012), many people take advantage of music's powerful effects. Against this background, we investigated music's uplifting and empowering function by experimentally examining music-induced manipulations of implicit and state self-esteem.

Method: The experiment (n = 119) consisted of three experimental conditions, which were expected to manipulate self-esteem in different ways. Each of them was comprised of three musical pieces that were previously evaluated (n = 26). The first condition was comprised of musical pieces expressing a positive self-view, pieces of the second condition expressed a negative self-view, and the third condition was comprised of pieces that changed from a negative to a positive self-view. Condition one and three were expected to enhance self-esteem. Condition two was expected to lower self-esteem. The design combined a within-subject with a between-groups design, measuring both state self-esteem (Rosenberg, 1965) and implicit self-esteem (IAT; Greenwald & Farnham, 2000) before and after the music listening.

Results: An analysis of variance (ANOVA) of state self-esteem after the treatment indicated that music listening significantly altered self-esteem. As expected, conditions one and three enhanced state self-esteem. In the second condition no significant changes were found.

Discussion: The results contribute to the explanation of music-induced positive feelings by showing that music enhances self-esteem and that this effect relies on the expressive properties of the musical piece. They further support the notion that music serves an important function for wellbeing in everyday life.

**Paul's** research is located at the intersection of musicology, psychology and aesthetics. He earned a major in systematic musicology at the University of Hamburg. Currently he is enrolled as PhD candidate and research fellow at the Max Planck Institute for empirical Aesthetics in Frankfurt am Main, Germany. In his dissertation I he investigates musical experiences as »technology of the self« and selfenhancement focusing on the relationship of music listening and selfesteem. Another project examined the musical taste of expert listeners by comparing selfreport data of musicology students to a control group in an on-

line survey. He is also currently the »Open Access Ambassador« of the Max Planck Institute where it is his responsibility to encourage and support open access publishing. Research interests include the social cognition of music, music aesthetics, musical taste, and conceptions of musical subjectivity.