

Abstracts

Wednesday

Aspects of music in medicine

Ralph Spintge

Sportklinik Hellersen, Lüdenscheid, Germany; University of Music and Drama HfMT Hamburg, Germany

Keynote 1

M103

9:30

As long as human civilisation does exist music is produced, consumed and used not only for aesthetic purposes, but also for healing purposes. Nowadays so-called medicofunctional music comprises musical stimuli intentionally designed and used as therapeutic agent in traditional medical settings, based on evidence from research following scientific standards accepted by medical communities around the world. While in earlier studies research focused on therapeutic effects, recent studies even include socioeconomic outcome parameters. Anxiolytic Music used against pain and stress will be described as an example of how such research is conducted and what significant effects do occur.

Dr med. Ralph Spintge is the director of the Regional Pain Centre DGS at Sportklinik Hellersen, Lüdenscheid, Germany. He is Board Certified for Anesthesiology, Pain medicine and Occupational Health, Lifetime Professor for Music Medicine and lecturer within the Music Therapy Master Course at the Institute for Music Therapy at the University of Music and Drama, Hamburg. Beginning in 1977 Spintge conducted a series of psychophysiological studies about the anxiolytic effects of music in Surgery, Anaesthesia, Pain Therapy, Obstetrics, and Dentistry at various institutions around the world. He was co-investigator within a 10-year research programme on "Rhythmicity, Heart Rate Variability and Cardiorespiratory Variability: The Neurovegetative Status in Man" in co-operation with the German Max-Planck-Society, based on a grant from Sporthilfe e.V.

His current research focuses on the impact of medicofunctional music on Heart Rate Variability in chronic pain. Spintge's publications comprise numerous articles and 22 books about innovations in anaesthesia and pain medicine, as well as applications of medicofunctional music. He is a founding member (1982) and currently President of the International Society for Music in Medicine (ISMM), honorary member of The International Association for Music and Medicine (IAMM), member of the International Association for the Study of Pain (IASP), the German Society for Medical Psychology, and an honorary member of the Music Therapy Association of Catalonia/Spain.

Music in our life: Learning and re-learning

Mari Tervaniemi

University of Helsinki, Finland

During past few decades, our knowledge about the brain functions and structures underlying music perception, performance, and emotions has accumulated relatively fast. However, much less is known about the brain determinants underlying music learning and music therapy. In the present talk, I will introduce data revealing the impact of music learning on brain functions in fetuses, toddlers and school-aged children. Furthermore, I will show results about music rehabilitation obtained from dementia patients and from other neurological patients. These very recent data indicate that music-related activities, even in terms of singing and listening to familiar songs, can effectively boost the emotional and cognitive well-being of the patients as well as their caregivers.

***Prof. Mari Tervaniemi** is a well-known expert in neurosciences of music. She obtained her PhD in psychology in 1997 (University of Helsinki). In addition to University of Helsinki, she has worked at the University of Jyväskylä as a professor and in Leipzig as a visiting Marie Curie fellow at the University of Leipzig in close collaboration with the researchers at the MPI for Human Cognitive and Brain Sciences. Currently she is the co-head of Cognitive Brain Research Unit, the head of Brain and Music team, and research director in the Cicero Learning network.*

Prof. Tervaniemi has published about 150 empirical papers and reviews in peer-reviewed international journals and several invited book chapters. Her research topics cover auditory neurocognition as well as the brain basis of musical expertise and music emotions. Of particular interest to her is to apply knowledge acquired within the framework of basic science into rehabilitation, education, and special education. For further information, see www.cbri.helsinki.fi/music.

Thursday

Keynote 2

M103

9:30

Friday

What *is* musical tempo?

Justin London

Carleton College, Northfield, USA

Keynote 3

M103

9:30

When we listen to music its tempo is rarely, if ever, in doubt. Within just a few seconds, we know whether the music is fast, moderate, or slow. Yet the cues for these judgments are not simple or straightforward. This presentation will begin with a few illustrative examples, which we will then unpack in terms of their beat rate, loudness, event density, and spectral flux. The effect of familiarity with the music (and musical style) will then be considered. Moving beyond auditory cues, the effect of watching others moving while listening, as well as one's own movement while listening, will be added to the picture, showing that tempo perception has important cross-modal aspects. Finally, and perhaps as a way of untangling the Gordian knot of the auditory, visual, and kinesthetic cues for tempo, an energistic account of tempo is given, suggesting that "tempo" is not so much a measure of musical speed, but rather an index of the energy required to produce and/or move with the music.

Justin London is Professor of Music at Carleton College in Northfield, MN, where he teaches courses in Music Theory, Music Psychology, Cognitive Science, and American Popular Music. He received his B.M. degree in Classical Guitar and his M.M. degree in Music Theory from the Cincinnati College-Conservatory of Music, and he holds a Ph.D. in Music History and Theory from the University of Pennsylvania, where he worked with Leonard Meyer. He has published widely in music theory, music perception and cognition, and musical aesthetics. His current research is on micro-timing in the complex rhythms found in Malian drumming (with Rainer Polak of the Max Planck Institute for Empirical Aesthetics, Frankfurt, and Nori Jacoby of MIT) and on the cross-modal perception of musical tempo (with Petri Toiviainen of the University of Jyväskylä). Professor London was co-director of the 2005 Mannes Institute for Advanced Studies in Music Theory on Rhythm and Temporality and in 2012 he served as co-chair of the Interdisciplinary College (IK) for cognitive science in Günne, Germany. He has held two Fulbright Fellowships, in 2005-2006 at University of Cambridge in 2014 at the University of Jyväskylä. He served President of the Society for Music Theory in 2007-2009, and is President-elect of the Society for Music Perception and Cognition.

A journey to ecstasy: The lived experiences of electronic dance music festival attendees

Noah Little, Birgitta Burger
University of Jyväskylä, Finland

Recently, there has been a growing global phenomenon of electronic dance music festivals. Worldrenowned electronic dance music festivals including Belgium's Tomorrowland, U.K's Creamfields, and Miami's Ultra Music Festival, are newly experiencing a drastic influx of festival attendance, societal acceptance, and media coverage. Previously, music festival investigations have primarily focused on motivational factors of attendance, drug incidence, and event management techniques. However, contemporary research has determined attendees are obtaining both psychological and social benefits from these music festivals. This study aimed to provide a detailed exploration of the lived experiences of individuals who attended a multi-day electronic dance music festival and was primarily interested in the perceived beneficial changes within the individual, following their festival experience. A semistructured qualitative interview was used to collect data from 12 individuals who attended the 2015 Electronic Daisy Carnival in Las Vegas. The data was analysed using thematic analysis. Within the data emerged the following themes: 1) motivation to attend 2) drug use and abstinence 3) festival atmosphere 4) positive social interactions 5) sense of community 6) perceived beneficial changes. We discovered that individuals believed the festival to be a spiritual-like experience that was sacred and personally meaningful to them. As well, the majority of participants reported abstinence (alcohol, illicit drugs) during their festival experience. Interestingly, following the festival, participants reported the adoption of new values including a greater respect and acceptance for others, the desire to improve themselves, and reduced anxiety. These findings add to the existing body of music festival literature, further contextualizing how music festivals are both experienced, and reflected upon by individuals.

Keywords: benefits, changes, festival, interaction, social

Wednesday

Papers 1

M103

11:00

Wednesday

Paradigms in the compositional practice of Irish singer-songwriters

Donnacha Toomey

Institute of Technology, Tralee, Ireland

Papers 1

M103

11:30

The singer-songwriter has emerged as a significant figure in contemporary Irish culture. Ireland's monumental history in musical practice has cultivated some of the most internationally respected singer-songwriters of recent decades. While much research has been devoted to the songs of Irish artists at large, little attention has been allocated to demystifying their songwriting praxis. The present work critically examines the relationship between the Irish singer-songwriter and wider mediated discourses surrounding their artistry. Independent of genre it interrogates the compositional practices of performing songwriters by way of phenomenological study. Specifically, the lived experience of Irish singer-songwriters is explored and evaluated through in-depth interviews, and consideration of artefacts including song texts and recordings. Tracing the most important sources of their creativity it is evident that while some practitioners are largely influenced by indigenous Irish folk music many are predisposed to multicultural traditions. Whilst experiences are unique to individual singer-songwriters many share similar complexities in attempting to migrate from conventional praxis. It is evident that limitations frequently provide artistic definition, thereby safeguarding the practitioner's aesthetic. Accession of an individual voice presents an interesting conundrum for a twenty first century singersongwriter as the emphasis of a traditional culture is by nature, not individually focused. It is concluded that while a grounded musical tradition may certainly be viewed as a privilege, much of the Irish singersongwriter's labour involves conscious effort in re-encoding their work.

Keywords: Irish, practice, culture, phenomenology, singer-songwriter

Does excessive practicing have addiction potential?

Christine Ahrends

Cologne College of Music, Germany

Wednesday

Papers 1

M103

12:00

As an explanation for music students' great amounts of practice hours Panksepp suggests "musical addiction", reasoning that activation of the reward center in other activities can lead to behavioral addiction. Indeed, recent studies from the domain of otolaryngology support the idea of behavioral addiction concerning music consumption. However, there has not been any research on the transferability of these findings to performing/practicing of music so far. Evidence shows that in some cases excessive practicing lacks self-control (e.g. by continuing practice through practice-induced pain), and when deprived of practicing, psychosomatic disorders (headaches, nightmares, insomnia, anxiety attacks etc.) have been reported, thus transforming a former expedient behavior into a maladaptive or even self-injurious one.

This study is conceived as a pre-study to give plausible reasons for or against the assumption of "musical addiction" and to suggest a description of possible symptoms.

At first, a theoretical part reflects on neurobiological and psychological conditions of both music practicing and behavioral addiction to reveal similarities. Based on the designs of the above mentioned studies and research on other forms of behavioral addiction (such as gambling disorder, sports addiction etc.) a questionnaire using Brown's six criteria of addiction is being developed and executed to provide evidence about symptoms of the phenomenon in question. In a next step, qualitative interviews with those subjects scoring the highest in the first part reveal additional symptoms or modifications to improve the questionnaire for further research. Finally, suggestions on studies to properly define the phenomenon and its prevalence among musicians are made based on the findings.

Despite theory supporting the assumption of an addictive character of excessive practicing, it seems unhelpful to pathologize this behavior until a clinical relevance has been proven in contrast to other rewarding activities. Interpretations should rather focus on self-injurious actions among musicians expressed by practice habits.

Keywords: self-injurious behavior, addiction, practice, reward system

Wednesday

Does empowering music enhance performance and risk-behavior in sports?

Paul Elvers, Jochen Steffens

Max Planck Institute for Empirical Aesthetics, Germany

Papers 1

M103

12:30

It is a common belief that music enhances sport performance and promotes self-esteem in athletes. In sports, music has been used to bring people in the right mindset prior to competitions, helping them to reach the peak of their confidence levels. But does this effect stand firm of scientific scrutiny? And what potential factors might explain an enhancing effect?

To this end the aim was to test whether motivational music improves sport performance and promotes risky behavior in sport settings. It was hypothesised that the effect of listening to motivational music is mediated by an enhancement of state self-esteem and a decrease in performance anxiety. It was further assumed that self-selected motivational music would have a greater effect on both outcome variables as compared to experimenter-selected motivational music. The study design requires participants to throw a ball into a funnel basket in multiple trials from various distances. While the hitting rate from fixed distances serves as a measure for the throwing performance, risk-behavior is assessed in trials where participants chose distances themselves. Participants were randomly assigned to one of the three experimental groups. The first group listened to self-selected music, the second to experimenter-selected music, and the third served as control group with no music.

At the time of abstract submission the experiment is being conducted in the laboratory of the Max Planck Institute for Empirical Aesthetics. Data collection is expected to be completed by the end of February.

Keywords: self-esteem, affectivity, empowering music, exercise

Are we dancing to the same beat? Empathy and interpersonal synchronisation in the silent disco

Joshua Bamford, Birgitta Burger, Petri Toiviainen
University of Jyväskylä, Finland

Previous studies have begun to examine the role of movement in music for conveying emotions, while some finger tapping studies have found that synchronisation increases interpersonal affiliation. However, music and movement studies have focused on individuals and comparatively few studies have involved participants in a joint setting. The aim of the proposed research is to examine the importance of synchronisation in a dance setting for building interpersonal affiliation. This is tested using a Silent Disco scenario, in which participants hear the music in slightly different timing to each other. Participants are drawn from the population of a Finnish university, and measured on the Big Five. One of each pair hears the original track, while their partner hears it either: unchanged (the synchronised condition), time-shifted by a quarter beat, or with a slightly stretched tempo. Subjective measures of enjoyment and affiliation were used to compare conditions, revealing that pairs subjectively rated their interaction as better when in the synchronised condition, although there was no effect on subjective enjoyment. Three styles of coping with asynchrony were observed, and these may be explained by personality differences. Furthermore, an association was observed between the Agreeableness trait and giving a positive rating to partner interaction in the Synchronised condition, indicating that high Agreeableness may predispose one to be more attuned to interpersonal synchrony. This study may provide new insights into the role of synchronisation in social dancing as it suggests that shared experiences create a greater sense of affiliation when shared in time.

Keywords: silent disco, empathy, music and movement, dance, entrainment

Wednesday

Papers 2A

M103

16:00

Wednesday

Embodied rhythm perception: The effect of head movement on rhythm reproduction

Li-Ching Wang

University of Cambridge, United Kingdom

Papers 2A

M103

16:30

This decade has seen an increase in studies investigating how listeners' body movement might affect their perception of musical time. Previous studies have tended to focus on the relationship between movement and the sense of the metrical structure while the perception of rhythm is still in need of further investigation. This paper examines the influence of active head movement on rhythm reproduction involving the perception and memory of rhythms and discusses the factors which may affect participants' ability to reproduce rhythms, such as their backgrounds, and the strategies they adopted to accomplish the tasks. An experiment of two tasks was conducted – a rhythm reproduction task followed by a drawing task which intended to understand how participants realise rhythms. Stimuli used in the reproduction tasks were 35 rhythms from Shmulevich & Povel's (2000) rhythm complexity table and those used in the drawing tasks were 9 rhythms from Smith et al.'s (1994) study on rhythm understanding. All 21 participants were instructed to accomplish both tasks under two conditions – move-head and no-move. The results revealed that despite the fact that most participants claimed they felt more confident in their answers in the no-move condition, they reproduced the rhythms more precisely in the move-head condition regardless of which strategy they took and what music training they had received ($F(1,13)=8.032$, $p=0.014$). The drawings showed that most participants seemed to adopt a combination of metric and figural strategies to understand rhythms and head movement could affect the methods they adopted. To conclude, onbeat head movement can assist participants to reproduce rhythms better and may serve the function of error detection which enabled the participants to be more aware of the mistakes they made.

Keywords: rhythm reproduction, memory, body movement, vestibular stimulation, rhythm drawing

Musical feedback: A new strategy in gait training for Parkinson's Disease patients

Marta Rizzonelli

Humboldt University Berlin, Germany

Rhythmic auditory stimulation (RAS) for gait training in Parkinson's disease has been applied successfully over the last three decades. The available literature supports its effectiveness systematically (e.g. Thaut 1996, Benoit 2014, Mainka 2015).

The purpose of this study is to investigate the effectiveness of an extended concept of RAS which is not limited to musical stimulation, but also includes musical feedback, which to date has not been investigated in Parkinson gait training.

In our study the comparison between RAS, musical feedback (MF), and no musical stimulation (NM) is conducted on a sample of 20 idiopathic Parkinsonian patients in a randomised cross-over design. Each patient has the task to walk for six minutes for each condition, focusing on stride length. He is instructed to make long steps and is connected with a software that is able to record stride length and cadence. In the RAS condition the patient listens to music with clearly accentuated rhythm. In the MF condition, as the stride length increases, the same musical piece used in the RAS condition goes through five different levels, ranging from a simple beat to a complete orchestral sound. The software records in which percentage every music level is covered, with higher levels corresponding to longer strides.

The study is still in progress, but our preliminary results confirm the expectation that MF facilitates stride length increase in a faster and more stable way than RAS does.

The reaction of the patient is fast, goal-directed and, most importantly, continuously encouraged by the musical feedback. These features make the gait training with musical feedback significantly different from and possibly more effective than classical RAS. Our results encourage further research on the role of musical feedback as a therapeutic device.

Keywords: Parkinson's, musical feedback, gait training, RAS

Wednesday

Papers 2A

M103

17:00

Wednesday

Sounds within reach: Enriched Environments for Physical Rehabilitation

Pedro Kirk¹, Mick Grierson¹, Rebeka Bodak², Lauren Stewart¹

¹Goldsmiths, University of London, United Kingdom; ²Aarhus University & The Royal Academy of Music Aarhus/Aalborg, Denmark

Papers 2A

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17:30

Background

Digital approaches to physical rehabilitation are becoming increasingly common and embedding these new technologies within a musical framework may be particularly motivating. Stroke survivors often receive little formal support to help with physical or psychosocial problems and are at considerable risk of incurring a secondary stroke. The challenge, therefore, is to offer stroke survivors a motivating framework for initiating and repeating specific physical exercises.

Study 1: Can Specialised Electronic Musical Instruments Aid Stroke Rehabilitation?

The exploratory study (Kirk, 2015) recruited stroke survivors (n = 43) from local community groups in London, between 6 months and 19 years post-stroke. All participants attended specially designed workshops playing music, both in groups and individually, using a number of digital musical interfaces (DMIs). Feedback forms were completed by all participants, which helped to develop the prototypes and gain insights into the potential benefits of music-making for rehabilitation. 93% of participants stated they thought that the music workshops were potentially beneficial for their rehabilitation.

Study 2: Motivating Stroke Rehabilitation through Music: A Feasibility Study Using Digital Musical Instruments in the Home

The feasibility study (Kirk et al, in press) aimed to test if DMIs could aid in the self-management of stroke rehabilitation in the home, focusing on seated forward reach movements of the upper limb. Participants (n=3), all at least 11 months post stroke, participated in 15 researcher-led music making sessions over a 5 week intervention period. The sessions involved them 'drumming' to the beat of self-chosen tunes using bespoke digital drum pads that were synced wirelessly to an iPad App and triggered percussion sounds as feedback. They were encouraged to continue these exercises when the researcher was not present. The results showed significant levels of self-management and significant increases in functional measures with some evidence for transfer into tasks of daily living.

Keywords: entrainment, self-managment, stroke rehabilitation, music therapy, digital musical interfaces

Music Performance Anxiety: Can observers perceive anxiety in the performer?

Pui Yin Kwan¹, Jonna Vuoskoski², Marc Thompson¹

¹University of Jyväskylä, Finland; ²University of Oxford, United Kingdom

Music Performance Anxiety (MPA) is known to affect musicians at different levels. Recent studies have shown that anxiety can induce changes in body movements, and that body movements could affect perceiving intended emotions of a music performance. It has been shown that individuals are able to perceive differences between intended emotions and the performer's felt emotions during a musical performance. However, it remains unclear whether different modalities (audiovisual, audioonly & video-only) will elicit differing responses in perceived anxiety. The present study aims to investigate whether MPA can be perceived in a musical performance under different modalities, and whether perceived anxiety ratings would be affected by the level of music expertise. Eight performers (5 pianists & 3 singers) completed the revised Kenny Music Performance Anxiety Inventory (K-MPAI). The performers were also videotaped and audio-recorded performing a repertoire of their choice in the presence and absence of an audience. Excerpts of the performances were presented to two groups of evaluator (N = 53) in three modalities. Evaluators were asked to rate the excerpts in terms of the performer's inner state in a 7-point Likert scale. The results showed that the high-anxious performers were rated as being more anxious when visual cues were available, while the low-anxious performers were perceived as more anxious when visual cues became unavailable. It was also revealed that the evaluators rated the performers as more anxious when they performed in presence of an audience. The finding of this study helps us to understand the importance of visual cues in assessing anxiety in the performer. The results also provide practical implications for online and blind auditions.

Keywords: music performance anxiety, music perception, felt emotion

Wednesday

Papers 2B

M106

16:00

Expressive performance and listeners' decoding of performed emotions: A multi-lab replication and extension

Jessica Akkermans¹, Renee Schapiro¹, Veronika Busch², Timo Fischinger³, Klaus Frieler⁴, Kai Lothwesen², Kathrin Schlemmer⁵, Daniel Shanahan⁶, Kelly Jakubowski¹, Daniel Müllensiefen¹

¹Goldsmiths University of London, United Kingdom; ²University of Bremen, Germany; ³Max Planck Institute for Empirical Aesthetics, Frankfurt am Main, Germany; ⁴University of Music "Franz Liszt", Weimar, Germany; ⁵Catholic University Eichstätt-Ingolstadt, Germany; ⁶Louisiana State University, Baton Rouge, Louisiana, USA

Until recently, there has been a lack of replication studies conducted in the field of music psychology. A highly-cited paper in the field by Juslin and Gabrielsson (1996) reported that performer's intended emotional expressions were decoded by listeners with a high degree of accuracy. While there have been related studies published on this topic, there has yet to be a direct replication of this paper. The present experiment joins the recent replication effort by producing a multi-lab replication using the original methodology of Juslin and Gabrielsson. Expressive performances of various emotions (e.g., happy, sad, angry, etc.) by professional musicians were recorded using the same melodies from the original study and are subsequently being presented to participants for emotional decoding (i.e., participants will rate the emotional quality of each excerpt using a 0-10 scale). The same instruments from the original study have been used (i.e., violin, voice, and flute), with the addition of piano. Furthermore, this experiment investigates potential factors (e.g., musicality, emotional intelligence, emotional contagion) that might explain individual differences in the decoding process. Finally, acoustic features in the recordings will be analysed post-hoc to assess which musical features contribute to the effective communication of emotions. The results of the acoustic and individual differences analyses will contribute to a more comprehensive understanding of when music can be an effective vehicle for emotional expression.

Keywords: listening, emotional decoding, multi-lab, replication, performance

Wednesday

Papers 2B

M106

17:00

Wednesday

Becoming and being a musician

Dawn Rose, Pamela Heaton, Alice Jones Bartoli
Goldsmiths, University of London, United Kingdom

Papers 2B

M106

17:30

Studies comparing musically trained and untrained children and adults provide evidence of short and long term structural, functional and behavioural changes associated with experience-specific adaptation within the cortical and subcortical sensory-motor neural networks. Researchers have suggested that changes associated with musical learning may transfer to near (fine motor ability) and/or far (general intelligence) domains. However, few studies have considered the concomitant development of a range of cognitive, behavioural and socio-emotional measures reflecting emerging musicianship. Two studies are presented here; firstly a quantitative longitudinal quasi-experimental investigation of multiple measures of musicianship. Over one academic year, 19 children received < 1 hour per week of statutory school music group lessons, and 19 children self-selected > 1 hour additional extracurricular musical instrument lessons for the first time over that year. A battery of tests included measures of intelligence, memory, motor abilities and parental and teacher reports of clinical and adaptive social and emotional behaviours. Results showed musical training enhanced hand-eye coordination and fluid intelligence (matrix reasoning subtest), replicating and extending previous studies. In order to better understand how these effects may be realised and experienced in established musicians, a second qualitative grounded theory study included 28 interviews with non-conformist and popular musicians as well as conductors and music producers. They reflected upon what it is to be a musician, and what qualities they were aware their experiences had brought to their lives. A musicians' model of musicianship emerged which challenges assumptions relating to the linearity of the concept of transfer effects. The data generates new hypotheses that musical learning supports and encourages flexible cognitive and behavioural skills that are further enhanced by the concomitant experience of nonverbal communications encompassing music and socialisation. Through the process of becoming, and the nature of being, this model suggests there is an ontology of musicians.

Keywords: socio-emotional, transfer, behavioural, musician, cognitive

The structure of absolute pitch abilities and its relationship to musical sophistication

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³Queen Mary University of London, United Kingdom

Two types of absolute pitch abilities have been identified from previous research: overt AP (e.g. Pitch labelling; oAP) is purported to be a rare binary ability possessed by a small proportion of people with a musical background, while latent AP (recognising or producing a well-known song at the correct pitch; IAP) is thought to exist in the general population and can be measured on a continuous scale. However, the measurement structure of these abilities (binary versus continuous) and the degree to which the two are related still needs to be confirmed. Furthermore, it may be that IAP is merely a sideeffect of singing ability, musical engagement, or formal musical training. The relationship between IAP and musical sophistication thus requires clarification. We therefore developed of a comprehensive test battery for measuring oAP and IAP in musicians and non-musicians to address the aforementioned questions. 104 musician and non-musician participants were tested on five oAP and three IAP pitch production and perception tests, as well as three subscales of the Goldsmiths Musical Sophistication Index self-report inventory. In a preliminary analysis, Gaussian mixture modelling showed oAP scores to be bimodal and IAP to be unimodally distributed. Variable selection for cluster discrimination and exploratory factor analysis suggested different pitch production tests as the most efficient measures of latent oAP and IAP abilities. A point-biserial correlation indicated a relationship between overall oAP and IAP scores, but this relationship was not found when participants with and without oAP were analysed as separate groups. There was no significant correlation between IAP scores and active engagement, musical training or singing ability. These results support previous findings that oAP is a binary ability and indicate that IAP is a continuously expressed ability which is distinct from oAP. Results further show that IAP is not a mere side-effect of musical sophistication.

Keywords: pitch memory, pitch perception, absolute pitch, musical sophistication, psychometrics

Thursday

Papers 3

M103

11:00

Thursday

Neural correlates of flow state in musicians

Jasmine Tan, Caroline Di Bernardi Luft, Joydeep Bhattacharya
Goldsmiths, University of London, United Kingdom

Papers 3

M103

11:30

Flow state is an extremely focused state of consciousness which occurs during intense engagement in an activity during which people typically experience feelings of intense pleasure and happiness, usually while performing at their peak. This study is the first of its kind in using EEG to examine neural activity in musicians experiencing flow. This is an exploratory study, the first part of which investigated factors predicting dispositional flow in musicians while the second examined if flow has neural correlates measurable with EEG.

48 musicians answered surveys on personality, emotional intelligence, musical sophistication and flow experience. Their scores were then correlated. Musicians also had their EEG data recorded while they self-induced flow by playing pieces that reliably put them into flow state and as a control, played music that did not induce flow state for them.

Musical sophistication, as measured by the Goldsmiths Musical Sophistication Index, was positively correlated with dispositional flow. The resting state EEG immediately after performance showed significant differences between the two conditions, particularly in the frontal areas. The state after experiencing flow had lower delta (1-4 Hz) power, higher upper alpha (10-12 Hz) power and higher beta (15-30 Hz) power than the state after not experiencing flow. Connectivity analysis shows a right frontal electrode cluster driving parietal and occipital electrodes in the state after flow but not non-flow. However, this pattern of activity was only present in participants with high dispositional flow. This suggests that it is possibly an important region of interest in flow state.

The results show some support for Dietrich's theory of flow as transient hypofrontality but more importantly, shows that flow has neural correlates measurable with EEG which can be a viable method to study flow in musical performance.

Keywords: musicians, EEG, flow, musical performance

Cerebral electrical activity triggered by music imagery and music perception: A comparative EEG study

Gabriela Pérez-Acosta¹, Óscar Yáñez Suárez², Miguel Ángel Porta García²

¹Programa de Doctorado en Música UNAM/Centro Nacional de Investigación, Documentación e Información Musical CENIDIM, Mexico; ²Laboratorio de Investigación en Neuroimagenología LINI/UAM, Mexico

This study constitutes a pilot protocol designed to gather preliminary information regarding electrical activity triggered by music imagery. The aim of the main study is to obtain evidence of the efferent activation from the auditory cortex on the cochlea. A previous research (Pérez-Acosta et al., 2006) showed an effect of musical imagery on spontaneous otoacoustic emissions (SOAEs) providing evidence of an efferent influence from the auditory cortex on the basilar membrane. However, considering a possible temporal delay between cortex activation and cochlear response, it was decided to include EEG recordings and SOAEs measurements at the same time. Nevertheless, taking into account that information obtained through EEG recordings from a complex cognitive task – such as music imagery – is not specific regarding areas and patterns of activation, a pilot study was designed to determine the type of cerebral electrical activity related to music imagery and possible differences or similarities compared to music perception. The study involved 6 subjects, 3 male (guitarists) and 3 female (pianists), with an average age of 27.6 years and 14.6 years of musical experience. A familiar musical tune was chosen (traditional Mexican tune, "Marcha de Zacatecas") and subjects were trained on the task of imagining it. Subjects remained seated and waited for the randomised instruction to appear in the screen, whether to imagine the tune or listen to it while EEG recordings were made using a 64-channel system (10-20). Data are currently being analysed, but considering previous studies alpha rhythms changes from the frontocentral and parietal areas are to be expected. Results obtained from the pilot study are expected to provide some knowledge regarding network connections related to the imagery task that may point out directions that could facilitate their analyses when having information both from the cochlea and EEG gathered at the same time.

Keywords: music imagery, music perception, EEG

Thursday

Papers 3

M103

12:00

Thursday

Music and language in the brain: Investigating the temporal nature of interaction between melodic and prosodic expectancy

Natalie Kohler

Goldsmiths, University of London, United Kingdom

Papers 3

M103

12:30

Music and language are both auditory channels of communication that exist in every known human culture and are assumed to draw on shared neural resources (e.g., Tillmann, 2012). Melody and prosody are comparable features in their dependency on rhythm and pitch changes (Heffner & Slevc, 2015) but so far surprisingly few studies have looked into the cognitive interaction of these two crucial features of music and language (e.g., Zioga, Luft & Bhattacharya, submitted).

The present study aims to investigate the temporal profile of the interaction between melody and prosody in an expectancy-violation paradigm in musicians and non-musicians. In a reaction-time statement-question identification task, participants will focus on the prosody of spoken sentences while passively hearing melodies. The melodies will end with an either expected or unexpected target tone whose onset will temporally precede, coincide or follow the decisive pitch contour change (question/statement) in the sentences. We further include one speech-only control condition.

Following Patel's Shared Syntactic Integration Resource Hypothesis (Patel, 2003), we expect to find interference between music and speech processing that differs in strength depending on the temporal relationship of the music and speech stream (word first versus music first). This would then reveal novel information about the speed of processing in the shared domains. Based on the training-induced auditory advantages of musicians (Conway, Pisoni, & Kronenberger, 2009), furthermore, we expect musically trained people to answer faster and more precise than non-musicians in the prosodic judgements. Overall, this study will reveal new insights into how music and language processing interact in human auditory perception systems and how musical training can influence language abilities.

Keywords: melody, shared processing, expectancy, prosody

Social inclusion as therapeutic and educational factor within a music therapy setting

Felix Loß

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Inclusive approaches for children with special needs are applied in both the fields of music therapy and (music) education. In practice, inclusive music therapy groups consist only of children with special needs, whereas an inclusive kindergarten group for example may consist of typical and non-typical children, but not in an actual therapy setting. Both practices hold explicit benefits for typical and nontypical children, however mutually exclusive of one another.

This study aims to explore the effects of social inclusion in a group consisting of typically and nontypically developing children within a music therapy setting. The focus lay on the therapeutic benefits for the special needs children and the educational benefits for the typical children. Furthermore, the study will outline the possibilities and limitations of the approach, and the implications it offers in the practice of music therapy and music education.

Therefore, a group of three children, including two typically developing girls and one boy diagnosed with Autism Spectrum Disorder (age between 4 and 7 years), received 18 sessions of music therapy. Each session's structure and activities were planned, evaluated, and reorganised through an action research paradigm. The process was video-taped and three of the sessions (beginning, middle-phase, end-phase), will be analysed using a mixed methods approach of quantitative content analysis and qualitative descriptive interpretation analysis. Additionally, interviews of the mothers were taken and will be analysed using qualitative content analysis.

Preliminary results show that the therapy for the boy with autism may have enhanced active pro-social behavior within and outside the therapy sessions, as well as apparently having increased the social skills of the typically developing girls. Furthermore, musical and social goals could be targeted in both therapeutic and educational ways.

Keywords: autism spectrum disorder, social inclusion, group music therapy, special needs, music education

Thursday

Papers 4A

M103

16:00

Thursday

Links between musical and linguistic skills in young pre-schoolers: The role of the home musical environment

Nina Politimou, Fabia Franco
Middlesex University, United Kingdom

Papers 4A

M103

16:30

The relationship between music and language has been examined in adults and school-aged children, with many studies associating linguistic advantages with formal musical training. However, the developmental path of early associations between these cognitive domains remains unclear, as relevant research is limited to children older than 3 years and has mainly targeted rhythmic abilities and early reading-related skills. Other linguistic skills crucial for academic achievement such as language structure have been understudied, although this ability has been linked to musical skills in older children (Gordon et al., 2014). Furthermore, the role of the home musical environment for linguistic skills development has been neglected. This research aims to fill these gaps by examining a) the relationship between musical skills, the development of language structure and phonological awareness in 3- and 4-year-old children and, b) the contribution of the home musical environment to linguistic skills.

Participating children completed age-appropriate musical tasks designed ad-hoc for this experiment and standardised measures evaluating the development of language structure, phonological awareness, and general ability. Parents completed self-reports about their musical profile and frequency and type of musical interactions within the family.

Results indicate that young pre-schoolers' musical abilities are linked to both linguistic domains. Musical sophistication of the parents and informal musical interactions in the home appear to be associated with language development, even when parental education is accounted for.

This investigation sheds light on the developmental path of the associations between linguistic and musical skills suggesting that at least certain features of language and music may rely on common learning mechanisms. Findings also suggest that a dimension that has so far been largely unexplored i.e., informal musical exposure and interactions in the home, may serve as scaffolding for extracting and internalising linguistic structures and information from the environment.

Keywords: musical skills, Home musical environment, language development, pre-schoolers

Live music in dementia care: Exploring key stakeholder role demands and training

Jessica Crich¹, David Reid¹, Helena Muller², Gail Mountain¹, Victoria Williamson¹

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Music has both anecdotal and evidence-based promise as an adjunctive aid in dementia care. Live music is considered a particularly beneficial music modality, promoting strong salutary effects for people with dementia and their caregivers. Despite this promise, live music remains underutilised across UK care homes, and there is chronic underrepresentation regarding the perspectives of key supporting stakeholders; musicians and carers (care staff, activities coordinators, home management; henceforth 'stakeholders'). The aim of this PhD project is to explore key issues surrounding multistakeholder live music provision in dementia care; conceptual understanding associating theory and practice, key stakeholder role demands and training and multi-cultural care staff perspectives. In examining these issues, this doctoral study extends the work of a pilot project investigating the impact of music provision in UK dementia care in collaboration with the charity Lost Chord, who provide live music sessions in the UK. Our research team observed and video-recorded the delivery of nine live music sessions in dementia care homes in the South Yorkshire area and conducted semistructured interviews with musician volunteers and care home staff. This presentation will discuss qualitative thematic analysis of the interviews, addressing comparative stakeholder perspectives and experiences of live music and dementia care training, with respect to literature review findings. Initial recommendations for future music and dementia care training will be proposed. The results of this study demonstrate a desire for collaborative partnership across key stakeholder roles and flexible training programmes to promote informed knowledge and learning when providing live music as part of long-term dementia care. This vital work presents a basis for understanding the relational impacts of providing live music as part of residential dementia care. The results will be used to generate evidence-based guidelines tailored to advance multi-stakeholder training, development and delivery of music use in dementia care homes.

Keywords: musicians, care homes, dementia, caregivers, live music

Thursday

Papers 4A

M103

17:00

Thursday

Are we really hearing in our heads what we think we're hearing? The role of audiation in musical improvisation

Keith Phillips

Papers 4B

Royal Northern College of Music, United Kingdom

M106

16:00

An important and valued part of the skill of musical improvisation is to be able to play what we hear in our head (audiation). Improvisation is a cognitively demanding activity, involving the production of musical material in real time. This requires the simultaneous involvement and coordination of many different skills, and places demands on working memory, memory retrieval, auditory and sensorimotor systems. Some recent studies support a cognitive model of improvisation which posits the deployment of stored rhythmic and melodic patterns via motor programmes. According to the theory of event coding, actions and their perceptual consequences share the same cognitive representation and behavioural and fMRI studies have offered evidence supporting this theory. Since musical actions have sounds as perceptual consequences and sensorimotor coupling is bidirectional, this is compatible with improvisers imagining the sounds as they play them. However, phenomenological accounts and interview studies suggest musicians use different strategies to generate ideas in improvisation, such as music-theoretic ideas and motor patterns or 'muscle memory'. So questions remain regarding the precise role of audiation in improvisation: what is musicians' experience of musical imagery as they improvise? Is auditory imagery cognitively prior to action or post hoc? How accurate is auditory imagery? What proportion of musical output involves audiation and how sensitive is this to context? The aim of this paper is to offer a coherent explanatory framework for improvisation from the perspective of cognitive psychology and to propose experimental paradigms to begin to answer some of these questions. On the basis of a review of the literature, it is concluded that two approaches offer a way forward: altered auditory feedback (AAF) and a blocking paradigm in which interference conditions seek to disrupt the tonal loop in working memory.

Keywords: audiation, improvisation, cognitive

Mild dissonance preferred over consonance in single chord perception

Imre Lahdelma¹, Tuomas Eerola²

¹University of Jyväskylä, Finland; ²Durham University, United Kingdom

Previous empirical research on harmony perception has mainly been concerned with horizontal aspects of harmony, turning considerable less attention to how listeners perceive emotions and acoustic qualities in single chords as such. A recent study (Lahdelma & Eerola, 2016) found mild dissonances to be more preferred than consonances in single chord perception, but the authors did not pursue any theoretical explanations of their finding. Moreover, they did not systematically vary register and consonance in their study. These omissions were explored here.

An online empirical experiment was conducted where participants (N = 410) evaluated pre-chord chords on the dimensions of Valence, Tension, Energy, Consonance, and Preference. 15 different chords (selected triads with inversions, tetrachords, pentachords and hexachords) were played with piano timbre across two octaves, with randomised roots (+/- 5 semitones around C4 and C5). In addition, participants' musical sophistication and musical preference were measured.

The results suggest significant differences on all five dimensions across chord types. The register contributed to the evaluations, as well as triadic inversions. The mildly dissonant minor ninth, major ninth, and minor seventh chords were rated highest for preference across both expert and inexperienced listeners. In addition, the participants' musical sophistication and musical preference moderately affected the chord evaluations. The role of theoretical explanations such as aggregate dyadic consonance (Huron, 1994), the inverted U-hypothesis (e.g., Berlyne, 1971), and psychoacoustic phenomena such as roughness, harmonicity, and sharpness will be discussed to account for the preference of mild dissonance over consonance in single chord perception.

Keywords: vertical harmony, psychoacoustics, preference, consonance/dissonance, chord

Thursday

Papers 4B

M106

16:30

Thursday

Adults' schematic and veridical expectations in response to melodic repetition.

Hayley Trower¹, Adam Ockelford¹, Arielle Bonneville-Roussy¹, Evangelos Himonides²

¹University of Roehampton, United Kingdom; ²Institute of Education, United Kingdom

Papers 4B

M106

17:00

A key question pertaining to expectations that arise from melodic repetition is: if the violation of expectations communicates emotional pleasure, why does this continue to happen even when the listener knows what is going to come next? The answer may be that there exist two forms of expectation; schematic (deep-rooted memory learned from an individual's exposure to music, and hears music as though for the first time) and veridical (concerning specific memory for a piece or phrase within the music). The role of veridical expectations is downplayed in the literature, despite the intuition that music is often simultaneously surprising and unsurprising. The purpose of the present research is to utilise a continuous response methodology to provide empirical support for the theory that the two independent forms of expectation are engaged during listening to familiar music. In a withinsubjects experiment, 30 adults gave note-by-note expectancy ratings in response to a 4 times repeated 26 note monophonic piano melody. A week later, participants took part in an identical experiment, totalling 8 repetitions of the same melodic stimulus. 8 random distractor notes were heard between each melody repetition. Participants rated by moving their finger along a touch sensitive controller. Results support the hypothesis that the two forms of expectation are activated during music listening. With each melody repetition, participants demonstrate a systematic increase in expectedness, yet the pattern of expectation remains intact. This finding suggests that although schematic expectations have been shown to resist veridical expectations, there is a dynamic relationship that alters with each new hearing, which enables the listener to repeatedly enjoy a piece of music through the co-existence of two memory systems.

Keywords: melodic, rating, adults, continuous, expectation

Friday

How conducting movement's kinematics communicates musical structures?

Yu-Fen Huang, Nikki Moran, Raymond MacDonald, Simon Coleman
Edinburgh University, United Kingdom

Papers 5

M103

11:30

Conductors use their body movement to communicate selected musical features. While listeners' and instrumentalists' musical movements have been widely explored and found to be closely related to musical structures including metre (Toiviainen et al., 2010) and phrase (MacRitchie et al., 2013), there is yet much to say about the particular ways in which conductors use their body movement to convey such musical structures. This study aims to contribute empirical observations on this topic, by examining how the kinematic features of conducting movement relate to musical structures such as rhythmic patterns, melodic peaks and dynamic changes. Six conductors rehearsed three pieces of music by Mozart, Dvorák and Bartók with a small string ensemble, while their upper body movement were recorded using the optical motion capture system, Qualisys. Kinematic parameters including movement distance, speed, acceleration, and jerk were extracted via Visual 3D and Matlab. Correlation analysis showed that conductors' movements have particular features respective to the music by different composers, and also musical passages with different rhythmic and melodic patterns. Temporal analysis of movement variability revealed conductors' movements at particular time points within each repertoire item which have distinctive movement kinematic features.

Keywords: conducting movement, kinematics, musical structure

Music-visual congruence and attention in film cognition

Timo Varelmann

University of Cologne, Germany

This paper deals with structural congruence based on temporal alignment of accented events in the musical and visual stream of moving pictures, and its interactions with attentional processes.

First, definitions of music-visual congruence and its proposed underlying cross-modal matching or grouping principles will be discussed (Cohen 2014/13, Iwamiya 2013, Lipscomb 2013, Stein et al. 2010).

Second, models on film music will be discussed that consider the establishment of structural congruence and its attentional consequences as implicit, purely bottom-up processes. Cohen's (2013) Congruence Association Model predicts that the viewer-listener's attentional focus of the visual scenography is triggered by visual features which share structure with music. Her research on congruence explored its interpretational effects of associative meaning. Lipscomb (2013) examined perceptual effects of accent structure alignment; his model implements consequences on attentional focus shifts. Yet, the congruence-attention-mechanism remains to be empirically tested (Cohen 2013).

Third, this mechanism will be linked with the pip and pop phenomenon, a bottom-up driven effect which has successfully been demonstrated in behavioral and ERP experiments (Van der Burg 2008/2011). A simple auditory stimulus ("pip") can enhance the saliency of a co-occurring visual stimulus, making it more likely to be captured by attention and to pop out in a complex, dynamic context. Crucially, this effect depends on the saliency of the auditory events (Talsma 2010). Linking this research to the film music contexts, saliency enhancement due to rhythmical organisation of the musical stream will be examined.

Fourth, the unidirectionality of congruence and attention will be discussed. Talsma (2010) argues that top-down modulatory attentional strategies based on goals and expectations can boost sensory sensitivity to establish audiovisual congruence in the absence of critical saliency of the auditory stimulus. Implications will be considered for the models mentioned above and for empirical research on music-visual congruence based on task-relevant congruency judgements.

Keywords: rhythm, multimodal perception, film cognition, film music, attention

Friday

Papers 5

M103

12:00

Friday

Social effects of interpersonal synchronisation during listening to music compared to a metronome: What can we learn from implicit measures?

Papers 5

M103

12:30

Jan Stupacher, Matthias Witte, Guilherme Wood
University of Graz, Austria

Interpersonal coordination, such as simultaneous rhythmic movement, is a fundamental way to form socioemotional connections. The social and emotional power of music might further strengthen such interpersonal bonds. Here, we tested if interpersonal synchronisation (synchronous vs. Asynchronous finger-tapping) affects sympathy and helpfulness more strongly when listening to music compared to a metronome. We tested 40 participants (20 females, $M=23.7$ years, $SD=2.60$) and used an explicit and an implicit measure to assess their social orientation toward a tapping partner (i.e. one of two experimenters). Participants directly rated the friendliness of the experimenter on a 9-point Likert scale. As a more indirect or implicit measure of social orientation, we counted the number of pencils (out of a total of eight) that the participants collected after the experimenter "accidentally" dropped them. After five seconds, the experimenter started to help the participants or collected the pencils herself. Results of the pencil test showed that participants were more helpful toward an experimenter who tapped synchronously compared to asynchronously, $\chi^2(1)=5.45$, $p=.020$. Importantly, this result was completely driven by the effect of interpersonal synchrony during listening to music, $\chi^2(1)=12.26$, $p<.001$. When listening to music, participants collected 38 pencils after tapping in interpersonal synchrony compared to only 13 pencils after tapping asynchronously. No such effect was found for the metronome. The results of explicit ratings of the experimenter's friendliness, however, did not confirm these effects. The direct ratings might have been more strongly influenced by social desirability or related motivational distortions. Since music is a product of social interactions and might even be the result of evolutionary adaptation, we conclude that especially during listening to music, interpersonal synchrony or asynchrony can fulfill or violate hard-wired social expectations. Additionally, we could show that implicit or indirect measures can help elucidate how music, movement and prosocial behavior are connected.

Keywords: sensorimotor synchronisation, joint action, interpersonal affiliation, social entrainment

Personality and musical preference using crowd-sourced excerpt-selection

Emily Carlson, Pasi Saari, Birgitta Burger, Petri Toivainen
University of Jyväskylä, Finland

Music preference has been related to individual differences like social identity, cognitive style, and personality, but preference can be difficult to quantify. Self-report measures may be too presumptive of shared genre definitions between listeners, while listener-ratings of expert-selected music may fail to reflect typical listeners' genre-boundaries. The current study aims to address this by using a crowdtagging to select music for studying preference. For the current study, 2407 tracks were collected and subsampled from the Last.fm crowd-tagging service and the EchoNest platform based on attributes such as genre, tempo, and danceability. The set was further subsampled according to tempo estimates and metadata from EchoNest, resulting in 48 excerpts from 12 genres. Participants (n=210) heard and rated the excerpts, rated each genre using the Short Test of Music Preferences (STOMP), and completed the Ten-Item Personality Index (TIPI). Mean ratings correlated significantly with STOMP scores ($r = .37-.83$, $p < .001$), suggesting that crowd-sourced genre ratings can provide a fairly reliable link between perception and genre-labels. PCA of the ratings revealed four musical components: 'Danceable,' 'Jazzy,' 'Hard,' and 'Rebellious.' Component scores correlated modestly but significantly with TIPI scores ($r = -.14-.20$, $p < .05$). Openness related positively to Jazzy scores but negatively to Hard scores, linking Openness to liking of complexity. Conscientiousness related negatively to Jazzy scores, suggesting easy-going listeners more readily enjoy improvisational styles. Extraversion related negatively to Hard scores, suggesting extroverts may prefer more positive valences. Agreeableness related negatively to Rebellious scores, in line with agreeable peoples' tendency towards cooperation. These results support and expand previous findings linking personality and music preference, and provide support for a novel method of using crowd-tagging in the study of music preference.

Keywords: music preference; crowd-sourcing; personality

Friday

Papers 6

M103

16:00

Friday

Papers 6

M103

16:30

How do the functions of music listening vary across situations and persons?

Fabian Greb¹, Wolff Schlotz¹, Jochen Steffens²

¹Max Planck Institute for Empirical Aesthetics, Germany; ²Technische Universität Berlin, Germany

Research mainly examines the functions of music listening as traits, whereas the potential variability across situations receives scant attention. Although many researchers mention the importance of situational influences on the way we interact with music, research on situation still is in its infancy. Hence, this study aimed to differentiate between dispositional and situational influences on the functions of music listening and to reveal their relative importance. Another goal was to identify the most important situational and dispositional variables predicting the functional use of music. To this end 587 persons completed an online study. Each participant sequentially described three self-selected listening situations and reported on situational characteristics (e.g. presence of other people, mood), the functional reasons for listening to music, and the music they usually listen to in the specific situation. After describing the listening situations, participants reported on sociodemographics and traits formerly shown to correlate with the functions of music (e.g. Big Five, musical taste). Mixed model analyses revealed that on average 36% of the variance of the functions was due to differences between persons and 64% of the variance was attributable to within-person differences between situations. For further analyses all situational variables were within-subject-centered to separate situation-related from individual-related effects. Several situational predictors such as activity while listening or presence of other people were shown to have significant effects on all functions. In conclusion, the study gives valuable insight into how situational factors affect the functions of music listening. It further supports the conceptualisation of the functions of music as both state and trait. As this study is part of a project aiming to predict music selection behavior, the potential significance of the functions as predictors will be analysed in further steps.

Keywords: functions of music listening, situational influences, music in everyday life, use of music

Emotion regulation with music: Can our favourite tunes alleviate loneliness?

Katharina Schäfer¹, Tuomas Eerola²

¹University of Jyväskylä, Finland; ²Durham University, United Kingdom

Loneliness has been identified as a major risk factor for our health, but it can be influenced positively by the use of media. In order to feel connected to others, people often immerse emotionally in narratives or form para-social relationships with TV characters (Hawkley & Cacioppo, 2010). There are suggestions from empirical research (Derrick, Gabriel, & Hugenberg, 2009; Greenwood & Long, 2009; Saarikallio & Erkkilä, 2007), that music could serve a similar function.

To explore the effect of music listening on loneliness, a between-subject design with two factors was implemented: (i) The need to belong, which comprised three conditions of autobiographical recall (interpersonal distress, task-related distress, and control), and (ii) an imagined music listening situation, which included either preferred or casual music. Both factors were operationalised as writing tasks. Mood was assessed before, between and after the writing. After the tasks, measures of loneliness and attachment were collected.

The results of 141 participants indicate that preferred music does not buffer against the negative emotional effects of interpersonal distress. On the contrary, emotional loneliness was heightened through the imagination of a situation where one would listen to one's preferred music. Yet at the same time, those who were thinking of their preferred music were in a significantly better mood. So, even though preferred music boosted feelings of loneliness, it also raised the mood simultaneously.

To explain these unexpected findings, we surmise that thinking of one's favourite music shifts the attention to one's personal history as more participants reported feelings of nostalgia in the favourite than in the casual music condition. Such focus on personally meaningful moments of one's past might in turn emphasise the discrepancy between past and present relationships and therefore amplify the feeling of loneliness. Nostalgia might also contribute to the mood lifting effect of favourite music.

Keywords: music listening, social surrogacy, emotion regulation, interpersonal distress, loneliness

Friday

Papers 6

M103

17:00

Wednesday

"I don't like that!" – Why and what for we dislike music

Taren Ackermann

Max Planck Institute for Empirical Aesthetics, Germany

Posters 1

Musical taste, understood as an attitude towards music, plays an important part in the way music listeners in Western cultures perceive and construct their self-concept. Listeners like or dislike specific music not only to satisfy their emotional and communicative needs, but also to create and affirm their own identity. But until now, research has focused mainly on the positive aspects of musical taste. To get to a better understanding of it, qualitative in-depth-interviews (N = 21) were conducted to explore the different dimensions and justifications individual participants offered in respect to music they particularly dislike. Prior to interview sessions the participants were asked to list their musical dislikes. Then, during the interviews, they were asked to give reasons for their rejection of each musical piece, artist or style given on their list and rate each item on a 10-point scale (0=neutral to 10=worst possible item). All interviews were analysed using qualitative content analysis. The results from this analysis show that reasons for likes and dislikes do not necessarily form opposite pairs, but are in some instances identical. Liking and disliking insofar serves the same function that listeners use both to express their identity and encourage social contact and cohesion. All participants confirmed that they can draw links between individual dislikes and their own identity. Disliking certain music also served as a means to avoid negative emotional states and moods, physical harm or unpleasant social situations. Additionally, musical expertise of listeners was identified as an important factor. So, the study provides further insight into the dimensions and functions of musical taste in general and disliked music in particular, and into how specifically individual dislikes are relevant for the creation and affirmation of one's self-concept.

Keywords: musical taste; dislikes; self concept

Electrolaryngography and electroglottography in the assessment of singing voice: A systematic literature review

Sara D'Amario, Helena Daffern

The University of York, Department of Electronics, United Kingdom

Wednesday

Posters 1

Electrolaryngography (Lx) and electroglottography (EGG) are non-invasive methods used to assess human vocal folds vibration, through the application of electrodes placed externally on either side of the neck at the level of the larynx, whose impedances can be monitored in vivo; they are widely used in clinics, laboratories, and professional voice studios to analyse speech and the singing voice. This paper provides a systematic review of the empirical investigation methods that make use of the LX/EGG in the analysis of singing voice, identifying and critically appraising the relevant studies, presenting a thematic analysis of the current applications, and highlighting research methodology and limitations of the tools.

Case-studies, pilot projects and major studies with detailed EGG/Lx based protocols, which provide an analysis of the characteristics of the singing voice, are included. The systematic review has produced a list of 83 evidence-based studies, sourced on electronic databases and the internet. The evaluation of the empirical studies published from the 80' highlights a broad range of applications in the science of the singing voice: analysis of the source-filter model in singers and its longitudinal development from childhood to adulthood; vibrato, tuning, vocal registers, various singing styles and blending in solo and ensemble performances; real-time visual feedback in singing training; effect of pregnancy, birth control pills and menstrual cycle on singing voice. Furthermore, the report shows several singing voice parameters measurable through LX/EGG that further expand the knowledge of this area, although the protocol sometimes lacks the completeness and transparency required to allow accurate reproduction. The report also recommends some best practices and limitations to be aware of, to avoid erroneous interpretations or faulty recordings (e.g., electrodes' size and placement).

Lx/EGG represents a powerful tool for the investigation of the singing voice in medical settings, research and teaching. Future research agendas are also proposed.

Keywords: electroglottography, electrolaryngography, singing, larynx

Wednesday

Mapping the sound world of the flute: Towards a classification of standard and extended techniques

Julie Delisle

Université de Montréal, Canada

Posters 1

In the search for new sounds, flutists and composers started about fifty years ago to explore new ways of playing the flute. These new ways of playing – also named extended techniques – have since been well integrated in the sound world of the instrument. In the last decades, some literature has been published containing general explanations of these techniques, and composers have made them part of the contemporary music language. However, the techniques described in these writings are generally classified in a rather arbitrary way, according to a nomenclature that has been developed through exploration processes. In this contribution, a new classification of flute playing techniques is proposed, with the aim of grouping them according to their role in sound production and to the gestural parameters that are involved for each of them.

First, an overview of existing publications about extended techniques since the 1960s is given, listing the principal categories of flute extended techniques established by their authors. Then, three possible functions of playing techniques are described: sound production mode, modification of existing sound parameters, and modulation or periodical/aperiodical alterations of an existing sound. A list of articulators involved in the sound production gesture is also given, and playing techniques are presented according to these two elements of classification: function and type of gesture.

This will lead to give a better portrait of the sound possibilities of the flute, and will help music teachers, composers and musicologists to give more precise and accurate indications concerning standard and extended playing techniques. A more effective notation, taking in account these aspects of sound production and flute playing, will be made possible, making music analysis and transmission of musical gestures easier. Finally, this also could help instrumentalists – both performers and improvisers – to refine and diversify their sound palette.

Keywords: musical gesture, extended techniques, flute, contemporary music, classification

Verification and validation of the Musical Self-Concept Inquiry (MUSCI) to measure 'musical self-concept' of German students at secondary education schools

Daniel Fiedler

University of Education Freiburg, Germany

Wednesday

Posters 1

Musical development can be very differently during adolescence and the mechanisms and reasons, which lead to these differences, are often objects of music educational research. To measure the aspects of musical development of German students, the psychometric construct 'musical self-concept' can be used. The first aim of this study was to verify the factor structure of the initial MUSCIquestionnaire to measure 'musical self-concept' of German students. The second aim was to respecify the underlying factor model as well as to validate the renewed sub-facets of the questionnaire with music-specific background variables (e. g. interest in 'music') as well as the construct 'musical sophistication'. Data of 516 students ($f = 260$, $m = 251$) from three Grammar ($n = 382$) and three Middle ($n = 112$) Schools as well as one Junior High School ($n = 22$) are presented. The data comprised self-assessed 'musical self-concept' and 'musical sophistication' as well as music-specific and demographic background variables. Data analyses included structural equation models, reliability measurement, and correlational analyses. Reliability and confirmatory factor analysis indicate only acceptable subscale reliabilities ($\alpha = .584$ to $.844$) and model fit indices (RMSEA = $.054$, $\chi^2/df = 2.519$, TLI = $.805$ CFI = $.829$) for the initial MUSCI. In contrast, the re-specified factor model shows a good fit (RMSEA = $.040$, $\chi^2/df = 1.808$, TLI = $.927$ CFI = $.941$) as well as good subscale reliabilities ($\alpha = .635$ to $.799$). In order to analyse concurrent validity, the relationships between the re-specified sub-facets of the MUSCI-questionnaire with 'musical sophistication' ($r = .113$ to $.567$) and musicspecific variables ($r = .112$ to $.489$) were defined. The results demonstrate that the renewed version of the MUSCI-questionnaire can be used to measure 'musical self-concept' of German students. However, a following multidimensional IRT must still confirm the model.

Keywords: questionnaire survey, musical development, secondary education, musical self-concept,

Wednesday

The effects of singing therapy on psychological and biological responses with women with postnatal depression (PND)

Saoirse Finn¹, Sarah Collin¹, Daisy Fancourt², Lauren Stewart¹

¹Goldsmiths, University of London, United Kingdom; ²The Royal College of Music, United Kingdom

Posters 1

This study aims to investigate the psychological and biological responses of new mothers with postnatal depression (PND) after singing. In a within-groups design, 40 mother-infant dyads will be randomly allocated to both group singing and group chatting interventions. Community musicians will lead singing therapies. Changes in psychological assessments of mood, anxiety and group bonding will be measured. Biological markers of the hypothalamic-pituitary adrenal axis (HPA) will be collected from saliva samples; hormones (cortisol, cortisone, progesterone, testosterone, dehydroepiandrosterone (DHEA)), and their ratios (cortisol/DHEA, cortisone/DHEA) will allow analysis for seven bio-markers. The relationships between the psychological and biological responses will be explored, and there will be an overall focus on how any changes may relate to the severity of current PND. This research will shed light on any changes pre and post singing, in order to highlight music's potential therapeutic effects for application in health and wellbeing settings. This project is currently in progress.

Keywords: health, singing, wellbeing, postnatal depression, bio-markers

Does musical training affect emotion processing abilities? Evidence for enhanced levels of empathy in amateur musicians

Nina Fisher, Reiner Sprengelmeyer, Ines Jentsch
University of St Andrews, United Kingdom

Wednesday

Posters 1

It is generally believed that music can affect our emotions in the short-term. Despite this, there is a lack of understanding of how musical activity may affect our emotional well-being and processing abilities over the long-term. Here we explore whether musical activity increases emotional well-being and/or processing abilities. Two cross-sectional studies are presented. The first exploratory experiment tested 100 young, healthy adults of varying levels of musical training on a large battery of standardised emotion processing tasks using computerised, as well as paper-and-pencil, and visual and auditory testing methods. Behavioural tasks tested emotion recognition and questionnaires measured emotion regulation abilities, levels of empathy, depression, anxiety and self-positivity. The second experiment tested a further sample of 103 young, healthy adults. Surprisingly, no relationship between general emotional well-being and musical training was found, however we did find a relationship between musical training and levels of empathy, and the ability to recognise emotional sounds. We believe that the results support models that suggest we engage in mental state attribution and activate mirror neurons while attempting to understand emotion in music. We propose that this activation during musical practice might positively influence certain selective dimensions of emotion processing and interpersonal skills beyond the musical domain.

Keywords: musical training, empathy, emotional processing

Investigating cognitive mechanisms of social interaction through musical joint action

Marvin Heimerich, Sascha Bullert, Bela Hardekopf, Lena Irnich, Kevin Kaiser, Sabrina Kierdorf, Kimberly Severijns, Konstantin Troidl, Rie Asano

University of Cologne, Germany

Wednesday

Posters 1

Contagion, Empathy and Theory of Mind (ToM) are important social cognitive mechanisms that develop gradually in human ontogeny (Bischof, 2008), enabling humans to interact with other human beings in a complex manner. However, the development of cognitive mechanisms for early social interaction is still underexplored. Therefore, the aim of the current paper is to investigate these mechanisms in a broader range from a theoretical as well as empirical perspective. In particular, we propose a music-centered approach, which allows us to investigate cognitive mechanisms of social interaction independently of children's language skills in a musical joint action setting. In our theoretical part, we delineate the social cognitive mechanisms, namely contagion, empathy and ToM. Especially, we suggest emergence of joint attention around nine months in ontogeny as a mile stone of the social cognitive development. Further, we propose that joint attentional skills scaffold empathy and ToM and is necessary to enable complex social communicative behaviors such as joint action. Our empirical part focuses on joint attentional behaviors and explores these in musical joint action of children of different age-groups (1.5–2.5 y; 3–4 y; 5–6 y) by using structured observation of video-recordings (Bakeman&Quera, 2012). The observation session takes place in a regular lesson of music education for young children, which includes interactive clapping, dancing and other rhythmic and musical gestures under the guidance of a tutor. Results of analysing indicators of social interactions such as gaze following, mimicry, gestures, and intra- and inter-individual synchronisation will be presented. It is claimed that investigating musical joint action provides a new possibility to explore how increasingly complex social cognitive mechanism emerge in human ontogeny in social communicative behaviors across a wide range of age and adds to current methods in social cognitive neuroscience.

Keywords: Structured observation, Musical joint action, Development, Social cognition

Wednesday

The influence of rhythmic musical features on gait-related movement

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Posters 1

Music and its rhythm have a profound effect on our sensorimotor system. This becomes apparent when we spontaneously synchronise our movements to an external beat: when we nod our heads or tap our feet to a catchy tune, when we're out dancing, or, less obviously, when it influences the way we walk.

Music and other rhythmic auditory cues have been found to improve gait in patients with movement disorders in terms of, for example, stride length and gait symmetry (e.g. Thaut, 2005). In studies using both music and metronome beats, it has been found that music increases stride length compared to metronome beats (Wittwer, Webster, & Hill, 2012; Styns et al., 2007). However, insufficient research has been conducted concerning the musical features that could evoke this difference, and which gait-related movements might change under the influence of music. The current study aims to explore the relationship between gait-related movement and rhythmic musical features, as well as to investigate the differences in movement between walking to metronome beats and walking to music.

32 musical stimuli were chosen based on various musical features: tempo, pulse clarity, genre, and rhythm. Additionally, four metronome stimuli were used, corresponding to the tempi in the musical stimuli. Participants (N=20) were instructed to walk naturally to the stimuli, suggesting they could walk off-beat if needed. An optical motion capture system was used to record participants' movements during the task.

Future kinematic analyses will explore correlations between specific body parts' movements (e.g. head, hands, or shoulders) and the above-mentioned musical features. Findings could have practical implications for sports science regarding the use of music while walking or running, and for musictherapy regarding the improvement of interventions for patients with movement disorders.

Keywords: musical features, motion capture, gait, music-induced movement

Finding new ways in studying music evoked emotions

Diana Kayser

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Wednesday

Posters 1

The study of music and emotion is a popular topic in the field of music psychology, but methods used to investigate this phenomenon are rather focused on how emotions in music are perceived rather than how they are experienced or felt. It is questionable if the standard methods like self-report (e.g. questionnaires, diaries) or measurements of heart rate, electrodermal activity and other physiological measurements give us enough information on how and if we experience emotions in music. Both methods are highly based on interpretation and retrospective evaluation about a experience.

In my research I am looking for methods that give us more insight about the subjective experience of music evoked emotions in a more objective way.

By studying facial expressions of emotion, this might be achieved. If an emotional experience is rather strong, a facial expression of emotion is produced in the listener's face. It is well documented in the Facial Action Coding System developed by Ekman and Friesen (1978), which muscle groups need to be activated to form a specific facial expression of emotion. This gives us the possibility to determine if a music-evoked emotion is experienced (felt), without the subject having to focus too much (or at all) on their experience. Other than with continuous rating while listening to music (another popular method used), constant cognitive load can be avoided. In addition, we can supposedly be more certain that the subject does not refer to what he or she is perceiving in the music or what he or she thinks is supposed to feel, but that the expression in the face represents the emotion he /truly/ felt.

Since I am still at the beginning of my research, this presentation will rather focus on methods that can be used to study facial expressions of emotion rather than results.

Keywords: facial expression, perception, emotion

Wednesday

Effects of coaching on generalist primary music teachers' classroom practice and their 'musical self-concept'.

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Posters 1

The majority of music lessons in primary schools are covered by generalist primary music teachers, usually with little or no training in teaching it. This practice-based research project is part a PhD programme to professionalise generalist music teachers in primary schools to teach music lessons. The aim of this study was to describe changes in the generalist primary music teachers' didactic classroom practices in teaching music. Moreover, this study aimed to analyse the generalist primary music teachers' development of their 'musical self-concept' (Spychiger, 2010). This longitudinal intervention study is qualitative in character. Participants were 8 generalist primary music teachers and 4 specialist primary music teachers (control group). The 8 generalist primary music teachers were divided into two groups. The first group (n=4) received four coaching sessions (group 1), the second group (n=4) received four coaching sessions and 56 hours of further education in music didactics (group 2). The control group received no special treatment. The individual coaching sessions for all generalist primary music teachers (group 1 and 2) followed the 'Content Focused Coaching' (CFC) concept. Empirical data were collected before the beginning and at the end of the study by video-observations of classroom performances in primary music lessons (n=24), and questionnaires concerning the teachers 'musical self-concepts' (n=24). The first findings seem to suggest on the one hand that generalist music teachers require fairly little support to enhance their didactic performance of teaching music in primary music lessons. But on the other hand it appears that coaching without a parallel measure of further education seems to be to no avail for the group of less musically trained generalist music teachers.

Keywords: primary school music lesson, video-based research, coaching, generalist, musical self-concept

Identity as a challenge in arts: Jennifer Walshe and her alter egos

Franziska Kloos

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Friday

Posters 2

Identity needs limitation. It defines and restricts. From Adorno to Butler, identity works through negativity. To an artist, these boundaries may not seem attractive at all. He will thus search for other, less restrictive terms of identity. In her MA thesis, the researcher analyses works by composer-performer Jennifer Walshe with a focus on postmodernist views on identity. Aspects are social criticism when it comes to identities and the internet, role models presented by the media or authenticity in pop music. Moreover, Walshe seems to explore identity of music itself – the relationships of music and other art forms, of music and noise, ultimately of the human voice as expressing personality within a society. Often, Walshe separates pure sonic phenomena from their original semantic content. Thus, the recipient has to create his own context in his imagination. Postmodernism has seen the death of the author – irritatingly, Walshe has a whole group of alter egos, Grúpat, do works for her. She thereby aims to push the boundaries of her sonic and artistic possibilities. Findings of the researcher's work will be presented at the symposium, including analyses of some of Walshe's pieces using the voice. Grúpat is featured regarding each alter ego's individuality in relation to Jennifer Walshe's identity as an artist, trying to answer the question whether Jennifer Walshe is an author who can take a stance.

Keywords: post-modernism, performance, identity

Friday

How trauma diagnostics could be improved?

Jukka Kuusela

University of Jyväskylä, Finland

Posters 2

This research is at an early stage – test data have not yet been collected. The first objective is to make a review article about the study in the field.

In the next step we aim to investigate the use of new methods for the diagnosis of trauma. There are of course already many instruments to measure trauma symptoms, but some of these measurement results may be distorted for different reasons. It is possible, according to some researchers, to ignore these problems with the projective testing methods because some of these methods use ambivalent stimuli. This study is carried out by comparing the audible, visual and audiovisual, projective test methods with each other. We will use music together with visual material as audiovisual stimuli and study responses (e.g. emotional and traumatic content, reaction time) of traumatised persons (n=20) and control groups (n=20) to these methods' material. There are also plans to link the subjects' eye movements follow-up to testing.

The hypothesis is, that audiovisual, projective method is more efficient than auditory and visual projective method and produce more diagnostically useful material for assessment of trauma. If this is true, audiovisual projective methods should be developed to meet the needs of trauma research and clinical practice.

Keywords: trauma, test, diagnostics, audiovisual, projective

Audio analysis tools on the development of a musically expressive performance

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Friday

Posters 2

In this article we discuss how some techniques in sound and music computing could be used by musicians during their practice in novel ways, in particular for augmenting the self-assessment process that occurs while developing a musical performance. We will be focusing in aspects related to musical expression, in the context of western music. Advancements in music technology are increasingly present in musicians' daily routine, and fostered the development of music making and consumption. During the last fifty years, these technologies evolved in an astonishing pace, especially after the birth and popularisation of digital computing and the Internet. These advances are now present from the creation to the production and distribution of music. We believe that through an objective approach involving the computational analysis of physical aspects of the musical sound, musicians could gain access to novel dimensions for the perception of their performance, and greatly improve their understanding over it. Using advanced Music Information Retrieval techniques to model expressivityrelated aspects of instrument playing (e.g. note articulation and dynamics, timbre control, timbre blending, timing, vibrato, glissando), we aim at creating tools that would allow musicians to get new insight on their practice. In this project we present our proposal for applying state-of-the-art MIR tools in the analysis, development and practice of musical performance, trying to bridge the gap between computer music laboratories and the professional musician practice room.

Keywords: performance analysis, music information retrieval, music expression

Friday

The influence of imitative body movements on the sensitivity to the conductor's expressive timings

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Posters 2

Temporal coordination and expressivity are essential constituents of the conductor's expressive timings communicated to ensemble musicians. Success of this communication vastly depends on the ability of the conductor and musicians to perform and perceive gestures, and even more important, to integrate the perception of these expressive timings into actions.

The conductor's expressive timings have been studied both from a conductor's and an observer's perspectives, however body movements have not been considered yet from the perspective of a musician. Present research aims at investigating the role of imitative body movements of musicians in their sensitivity to expressive timings communicated by a conductor. Imitation is considered as a form of corporeal articulation, which is based on a mirroring process. By imitating other people, we see other people as similar to us, i.e. we can understand other people's actions, emotions and intentions. Therefore we believe that imitating the conductor's gestures will enhance musicians' understanding of the conductor's musical intentions, and accordingly increase sensitivity to temporal beat patterns. To test our hypothesis, we applied a 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 were musicians experienced in playing under the lead of the conductor. Firstly, they had to watch and imitate the conductor's gestures by listening to the music and looking at the conductor. Secondly, they had to play a melody from the musical composition, which they had just listened, together with the conductor and an ensemble. A main dependent variable is synchronisation between a participant and the conductor. We suppose that after having imitated the conductor's gestures musicians would demonstrate better synchronisation performance.

Keywords: synchronisation, musical communication, imitation, conductor's expressive timings, body movement

Parai melam music in Jaffna Tamil culture, Sri Lanka: An ethnomusicological study

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University of Kentucky, USA

Friday

Posters 2

Parai melam (a double-headed cylindrical drum played with two sticks) music occupies a significant position in Jaffna Tamil culture, Sri Lanka. This is an area which is worthy of scrutiny with regard to its emergence, development, uniqueness, position, performance, changes and continuity. In world drum tradition, parai melam music tradition has a long historical explanation, but unfortunately this performing art has become a diminishing culture due to various factors. These factors vary in the context of caste, culture and religious, rituals which are key spheres of Jaffna Tamil culture. As this music culture represents the notions of auspiciousness and inauspiciousness, this study further intends to explore anthropologically. Symbolic and cultural expressions of parai melam are most significant in caste and religious contexts. Though auspiciousness includes Hindu religious pantheon and rituals, performing arts and other fields of music, there is an ambiguity in the notion of auspiciousness while periya melam music is dominantly mandatory for auspiciousness in the Hindu pantheon of Jaffna. Seemingly, there are some drumming rhythms that are identified as inauspiciousness as they are associated with funeral observances. Structural replication and downward displacement and pollution and purity have characterised the nature of inauspiciousness of parai melam music and performers. The major objective of this study is to examine the position and placement of parai melam music in Tamil culture in the context of changing modern society, what are the structural and cultural consensus for making auspiciousness and inauspiciousness, and how the music rhythms are created, performed, taught, preserved, sustained, and continued? Methodologically, ethnographic research methods including ethnomusicological perspectives and methods have been employed in this study, which comprises qualitative data derived from the fieldwork conducted among the paraiyar community in different villages of Jaffna.

Keywords: Hinduism, auspiciousness, inauspiciousness, parai melam music, caste system

Friday

Hearing is believing: Towards a new method of analysis for vocal timbre in popular vocal song

Kristal Spreadborough

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Posters 2

The way we use and manipulate sound in music is constantly evolving. Music analysis techniques, however, have not always kept pace with this evolution. This is particularly evident in vocal timbre analysis, specifically in popular, lyric based, vocal song genres (hence forth called popular vocal songs). This is problematic for popular vocal song analysis as this song type typically relies heavily on the vocal line for expression. Given the vocal line consists of both vocal timbre and lyrics, that we lack efficient and robust analytical techniques that can account the emotive content of vocal timbre, and its impact on emotional perception of lyrics, leaves a gap in our analysis.

This paper proposes the development of an analytical technique for vocal timbre analysis centered on the hypothesis that vocal timbre impacts emotional perception of sung words. The proposed technique considers how the emotive content of vocal timbre impacts emotional perception of lyrics. It can be summarised through the following model: if emotionally charged word/s are sung with an incongruent emotionally charged vocal timbre, then the emotional perception of that word/s is likely to be impacted by the emotion expressed by the vocal timbre. Two reception tests were conducted to test this hypothesis – results from these tests support the hypothesis.

This model forms part of the proposed technique which will be a multi-step process addressing the following areas: 1) the appropriateness of vocal timbre analysis, 2) how to make vocal timbre analysis clear and efficient, 3) how to approach analysis of a musical element that is predominantly aural in nature (i.e. not usually not conventionally written down). The first two steps situate and streamline our analysis, while this final step forms the basis of analysis. This paper will introduce this analytical technique and provide a case study to demonstrate its application.

Keywords: vocal timbre, emotional perception, vocal timbre analysis, popular vocal song, popular music theory

How important is the reproduction technique for the perception of spaciousness in music?

Claudia Stirnat

University of Hamburg, Germany

Friday

Posters 2

Background:

Sound fields are preferred when spaciousness is perceived (Blauert and Lindemann, 1986). "Spaciousness means that auditory events, in a characteristic way, are themselves perceived as being spread out in an extended region of space" (Blauert, 1997). The author's former study (2012) investigated the perception of spaciousness of five musical genres. Participants evaluated spaciousness while listening to music with loudspeakers. Resulting, these genres allowed classifications of spatial features such as "big", "wide" and "open". A new idea of conducting listening tests has arisen using wave field synthesis instead of headphones (e.g. Laumann, Theile and Fastl (2008)).

Aims:

Firstly, this study aims to reveal the perceptual characteristics of spaciousness in music itself with headphones, loudspeakers and wave field synthesis. Secondly, it will find the differences of perception when participants listen with headphones, loudspeakers and wave field synthesis. Thirdly, this study's goal is to investigate the possibility of replacing headphones with wave field synthesis for listening tests.

Method:

A hearing test has been conducted asking participants for their spacious impression. Participants rated 30 music excerpts on a 7 Point-Likert-Scale from "little spacious" to "much spacious". The music excerpts were recorded in an anechoic chamber with various instruments and played to 28 Participants through headphones, loudspeakers and a wave field synthesis system including a tracking system. Dummy head measurements for an objective comparison were made.

Results:

3x3 ANOVA repeated measures revealed a significant Within-Subject effect for the technical devices ($F = 4.541$, $p < 0.05$), different instrument groups ($F = 71.281$, $p < 0.01$) and also for the interaction technical devices-instrument groups ($F = 7.700$, $p < 0.01$).

Conclusion:

The kind and number of music instruments on the one hand and the reproduction technique on the other hand influences the perception of spaciousness. Consequently, the reproduction technique is somewhat important.

Keywords: music perception, psychoacoustics, spaciousness, wave field synthesis, acoustics

Friday

"Music in mental hospital" – Historical perspectives on the use of music and music therapy in Finnish psychiatric hospitals

Sami Tynys

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Posters 2

Music has been part of Finnish hospital psychiatry for more than 100 years. Now this tradition is fading. Psychiatric services have undergone profound changes over the last few decades. Hospitals have been downsized or closed, and the treatment of patients has been handed from institutions to the community and general hospitals.

Psychiatric music therapy has evolved from hospital treatment (Aldridge 1996). There is a historical need for music therapy, and today's music therapy needs a history (Horden 2001). According to previous studies, music therapy in Finland began as recreational activity in psychiatric and other institutions. Since the 70's music therapy has developed into its modern forms.

This research paper is part of a Ph.D. study on music therapy at the University of Jyväskylä, Finland. The study traces the evolution of general music use and music therapy in Finnish psychiatric hospitals from late 19th century to the present.

The data were collected from historical documents, books and articles on music therapy, and examined using qualitative content analysis. For verification, face validity was used.

The results suggest that music has been utilised in hospitals in multiple ways; connecting to hospital culture, treatment and rehabilitation, and religion. From its early design, the purpose of music therapy has become more specific.

Descriptive analysis yielded more information on the use of music and music therapy in hospitals. The concrete purposes were harder to identify, and hermeneutics was used to interpret the results. Further research is required on the evolution of psychiatric services. The related Ph.D. study aims to stimulate discussion of future opportunities and development of adult music therapy. This poster presentation is aimed at therapists, and those interested in cultural history, psychiatry, and the healing power of music.

Keywords: psychiatric hospitals, qualitative content analysis, music therapy, cultural history

The Quartet Theory of Human Emotions and the Human Sadness System compared: Music-evoked sadness and joy

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Friday

Posters 2

During the last two decades, there has been an enormously increasing interest in the neural correlates of music-evoked emotions and the evolution of music. Recently Stefan Koelsch and colleagues (Koelsch et al. 2015) proposed an integrating framework for the neuroscience of emotions with their Quartet Theory of Human Emotions (QToHE). With the Human Sadness System (HSS) Jaak Panksepp (2003, 2009) offered a biopsychological account for understanding the strong emotion evoked by sad music. My aim is to explore QToHE's potential for research on musical emotions in connection with HSS. A comparative analysis of QToHE and HSS focusing on cingulate cortex, periaqueductal gray area, thalamus, and hippocampus from the perspective of functional neuroanatomy is given. Aspects of evolutionary considerations are also taken into account. My main results are that both QToHE and HSS incorporate cingulate cortex, periaqueductal gray and thalamus. But QToHE puts the hippocampus back again into focus for emotional processing of music-evoked joy and tenderness whereas the hippocampus is lacking in HSS. HSS is heavily based on evolutionary considerations and cross-species research tracing HSS back to the Guinea pig's separation distress circuit whereas QToHE is based on results of investigating human brains by imaging studies and evolutionary considerations are not its main focus. The brain-stem related affect-system of QToHE incorporates besides the reticular formation for arousal also as another part as in HSS the periaqueductal gray area which mediates vocal expression of emotions. My conclusion is that connecting both theories might help to solve the riddle why music-evoked sadness is experienced in a pleasurable manner (Sachs, Damasio, & Habibi 2015). Therefore, future research on music-evoked emotional processing of sadness should be carried out by investigating how the processing of music-evoked emotion in HSS relates to processing the positive emotions of joy, tenderness, and peacefulness mediated by the hippocampal formation.

Keywords: hippocampus, Quartet Theory of Human Emotions, Human Sadness System, music evoked emotion, sadness

Friday

Isomorphism of pitch and time

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Posters 2

An ongoing debate regarding the perception of pitch and time is whether information on the two dimensions is processed independently or interactively. To study this, we tested whether listeners prefer sequences in which tonally stable tones coincide with rhythmically stable tones. Our study builds on a noted isomorphism between pitch intervals in the diatonic scale and tone durations in the standard rhythm originating in Ghana. This isomorphism is shown in a) the maximally even structure of 2212221 and b) the cyclic nature with seven possible starting points. To better understand pitch-time relationship, we conducted two experiments. In Experiment 1, we created seven scales based on the diatonic pattern and seven rhythms based on the standard pattern by shifting the starting pitch interval or tone duration. To measure the perceived tonal stability of tones in the scales, in Experiment 1a each scale was followed by a probe tone and listeners judged how well the tone fit into the scale. To measure the perceived rhythmic stability of tones in the rhythms, in Experiment 1b each position of the sequences was accented dynamically and listeners judged how well the accent fit into the rhythm. These ratings were then used in analyzing the results of Experiment 2 that used all 49 pairs combining the 7 scales and 7 rhythms in Experiment 1. Participants rated a) how well the rhythm fits the scale for each pair and b) familiarity and well-formedness of each scale and rhythm. Results show that probe ratings from Experiment 1 predict judgments in Experiment 2. Specifically, scale/rhythm pairs received higher ratings when tonal and rhythmic hierarchies correlated more strongly with each other. In addition, we found a familiarity bias toward the major scale. After accounting for this bias, results remain significant, suggesting that information from the two individual dimensions interact perceptually.

Keywords: pitch-time relationship, tone duration, probe tone, diatonic scale, standard pattern