
SYSMUSDAY

Systematic Musicology in Graz



Abstracts

Edited by Martin Winter, Richard Parncutt and Bernd Brabec de Mori

Karl-Franzens-Universität Graz
Geisteswissenschaftliche
Fakultät



PROGRAM

13:45 Welcome

by **Richard Parncutt**, Graz: Systematic Musicology in Graz

14:00 – 15:30 Research reports

14:00 **Thomas Felfer**, Graz: Sound memories. An experiment of an ethnography of »listening«

14:30 **David Mahler**, Salzburg: The effects of different types of music after a stressful situation

15:00 **Daniela Prem**, Graz: Jazz voice sounds: Creating a timbre database for research and musical practice

15:30 Coffee break

16:00 Piano performance

by **Erica Bisesi**, Graz: A selection of Chopin Préludes op.28

16:30 – 18:00 Research reports

16:30 **Manuela Marin & Joydeep Bhattacharya**, Vienna/London: Modelling flow in piano performance

17:00 **Réka Koren & Bruno Gingras**, London: Perceiving individuality in musical performance: Recognizing harpsichordists playing different pieces

17:30 **Changiz Mohiyeddini & Golazin Memar Ardestani**, Salzburg/London: Emotion regulation and physiological responses to musical mood induction

18:00 Poster presentation and buffet

18:30 Marimba performance

by **La Marimba graZiosa**, Graz

18:45 Presentation of local research groups:

- Institute for Ethnomusicology
- MusicMediaPublishing
- Institute for Composition, Music Theory, Music History, and Conducting
- Centre for Systematic Musicology
- Institute of Electronic Music and Acoustics (IEM)
- Pop / Music + Media / Arts
- AMseL, Institute for Psychology
- Institute for Aesthetics of Music

20:15 Keynote Lecture

by **Suvi Saarikallio**, Jyväskylä (Finland): Music as emotional self-regulation

WELCOME TO SYSMUSDAY!

On behalf of my colleagues at the Centre for Systematic Musicology, welcome to our first SysMusDay! SysMus Graz aims to make significant, original contributions to research and teaching in SysMus, focusing on music psychology. SysMusDay additionally promotes the visibility and networking of local researchers and research groups in all areas of SysMus. SysMusDay will clarify the general idea of SysMus by presenting examples to academics and the general public. Finally, we are taking the opportunity to present our teaching and to highlight its basis in current international research.

What is the difference between music and mere sound? Why does music exist and what are its psychological and social functions? How do music instruments work? What motivates people to make and listen to music? How do musical abilities develop? How can musical behavior be understood? How does the feeling get into the music, and what meanings are communicated by sounds and movements? How is musical information processed by human beings and can machines emulate that? Questions of this kind characterize SysMus. To answer them, SysMus brings together insights and epistemologies from the natural, social and formal sciences, humanities, and cultural studies. SysMus attempts to explain music as a physical signal, as a physiological process, as sound and movement, as experience, as human behavior, as social and cultural phenomenon and as information.

Graz's Bachelors (BA) and Masters (MA) program in musicology is one of the world's most epistemologically diverse. Offered jointly by the University of Graz and the University of Music and Performing Arts Graz, it includes a strong SysMus component. In the seminar "Music psychology" in the 5th semester, students prepare posters in the style of an international conference, which are on display at SysMusDay. The posters link teaching content with modern procedures of research and dissemination. Masters students in the "Music Psychology and Acoustics" module are exposed more directly to current international research. In a recent lecture series on "Music Performance Research", local research projects were presented by the researchers themselves. Students were challenged to evaluate their aims, methods and implications and to explore the potential of new interdisciplinary interactions. A similar lecture series on "Music, Religion and Spirituality" is planned for winter 2011. In a recent seminar on "Music and Cultural Integration", students interviewed representatives of different cultural groups in Graz; results will be submitted to both a leading international journal and the City of Graz, along with suggestions for practical implementation. The current seminar on "History of Music Perception" will lead to a publication and an international conference in Graz in 2012 on "Cognition of Early Polyphony".

My colleagues and I hope that you enjoy the program that we have prepared for you. We welcome any questions, and suggestions about our goals and strategies, as described in more detail on our homepage.

Richard Parncutt

Head of the Centre for Systematic Musicology

INDIVIDUAL RESEARCH PRESENTATIONS

Keynote: Music as emotional self-regulation

Suvi Saarikallio

We perform and listen to music for many reasons. Often, we want to experience a specific emotion. Recent research has shown that music is one of the best ways to regulate one's emotional state. We do that regularly in our everyday lives, both consciously and unconsciously.

In this lecture, I will summarize recent empirical and theoretical studies of music as a means of emotional self-regulation. I will clarify the central theoretical concepts and present recent empirical findings, emphasizing individual differences. For example, a teenager might look for comfort and understanding for his or her bad feelings by blasting out heavy metal; elderly people might sing hymns in church for the same reason. In general, the way an individual uses music to regulate emotions can depend on several factors including general emotionality and musical background.

Dr. Suvi Saarikallio is a Finnish Academy Research Fellow and is currently working at the Finnish Centre of Excellence in Interdisciplinary Music Research, University of Jyväskylä. Her research focuses on music and emotion, music and well-being, and the developmental psychology of music, and has been published in international peer-reviewed journals such as *Psychology of Music*, *Musicae Scientiae*, and *Nordic Journal of Music Therapy*.

Sound memories. An experiment of an “ethnography of »listening«”

Thomas Felfer

Sound or noise affect our daily life. This happens in the morning when the alarm clock helps us to wake up, or when the ringtones, tell us that “our” mobile phone is ringing. However, sound does not only have a signal-character, it has also an emotional quality.

The sensual perception affects our daily routine. When we visit a pub for example the “background” noise is one factor in our reaction feeling either “relaxed” or “uncomfortable”. This phenomenon led me to consider the relationship between individuals and sound. If we take a newspaper for example, we discover that any newspaper deals with “sound” in two main categories. First in the cultural sector as music and second when noise affects everyday life; but noise is not measurable, it is more based on our “cultural” disposition.

Perception is not a blank sheet, which gets filled with any number of influences; it is more like a sieve, where a large portion of the unfamiliar fall through. This sieve covers the environment and our perception of the environment. In other words it all depends on how we personally interact with sound. This interaction is the focus of my work, because listening (which is my essential thesis), is affected by our social lifestyle.

The main theoretical models for my paper are Pierre Bourdieu's theory of “taste” and Gerhard Schulzes work about the thrill-seeking society. Bourdieu investigates the connection between the social structure and “taste”, in other words, the correlation relationships between the positions within the social system and the individual's lifestyle choices. Converting this to my purpose “listening” is not only to receive information. The information has to be in a personal context or in a relationship to a special system of codes. Gerhard Schulze says that the thinking of social classes is now obsolete, because the choice of relationship becomes more important than the original conditioned relationships. This is due to how society has changed from one of scarcity to one of affluence

As empirical framework I use a method called *écoute réactivée*, from Jean-Francois Augoyard. The method works using sound files at the interviews. Environmental *sound* is the stimulus for the communication; it should help the subject to talk about their personal sound experiences. I decided to deal with sound memories, since I believe that everybody has an experience where “sound” evokes memories of a special place or moment. This also includes music but combined with prepared environmental sounds it comes closer to my thinking of an “ethnography of listening” which is more an experiment than a field of study.

Empirical findings have shown that the perception of sound is strongly linked with the parameters *age* and *mobility*; also the *social origin* in form of the family environment is very important. The chosen milieu allows “social actors” to produce “practices of listening.” These practices could be used as strategies to distinguish between differing lifestyles.

We don't hear what we hear, we hear what we want to hear or expect to hear.

The effects of different types of music after a stressful situation

David Mahler

Although it is known that music can be effective in reducing negative effects of stress, the existing research in this regard remains relatively inconsistent. Therefore the purpose of this study was to replicate some of these findings in an experimental setting by comparing the effects of different types of music on the recovery of anxiety after a stressful situation.

After experiencing a stressful attention test, subjects were exposed to relaxing classical music, heavy metal music or silence. 54 undergraduate college students (mean age = 22.4), 29 females and 16 males, were randomly assigned to one of the three groups. State-anxiety levels were measured with a self-report questionnaire at the beginning of the experiment, during the attention test and after the recovery phase (acoustical presentation or silence). The stressful attention test significantly evoked participant's state-anxiety levels. The selection of music based on musical structure characteristics, which are connected with the relaxing and activating effect of music. Compared to activating music, relaxing music is characterized by low tempo, no changes in tempo, a narrow frequency range and low complexity. The group that listened to relaxing classical music heard first a composition of Christoph Willibald Gluck (*Dance of the Blessed Spirits*) and then a piece from Georg Friedrich Händel (*Largo*). The subjects in the heavy metal group heard a track from Death Angel (*The Ultra-Violence*). All three tracks were entirely instrumental and in both groups music was presented for ten minutes via headphones in

normalized volume. After the experiment a questionnaire about the use of music in everyday life was conducted.

Regarding the state-anxiety levels before and after the recovery phase, results indicate listening to classical music and sitting in silence significantly reduces participant's state-anxiety compared to listening to heavy metal music. However, after the recovery phase only between classical music and heavy metal music a significant difference in state-anxiety appeared. In contrast to other studies, the results of the present study revealed no significant difference between listening to classical music and sitting in silence regarding state-anxiety levels after the recovery phase.

According to the questionnaire about the everyday use of music, young people often use music for relaxation, to affect their moods and to cope with stress.

Jazz voice sounds: Creating a timbre database for research and musical practice

Daniela Prem

In musical research the description of timbre poses significant problems. Generally timbre, is described as the colour or quality of sounds, and is conceptually divorced from pitch and loudness (Wessel, 1979). Psychoacoustical analysis methods are usually limited to quantitative measurement and multidimensional scaling, and the results are lacking in applicability for musical practice. Therefore researchers have cooperated with musicians and focussed on their perceptions and descriptions of sound. The simple question of how musicians describe timbre leads to the non-surprisingly answer: By words. It is surprising how little research has documented the large vocabulary of words and phrases used by musicians to describe instrumental and vocal timbre (Traube et al., 2004; 2006; Henrich et al., 2007; Garnier et al., 2007). Prem and Parncutt (2007; 2008) listed 250 timbre descriptors used by six professional female jazz vocalists during lessons and when describing recordings. The vocabulary is individual and intuitive and refers strongly to corporality (Prem and Parncutt, 2009).

In my dissertation, I plan to clarify the meanings of descriptors from acoustical, physiological and cultural perspectives. In replacing the term "timbre" by the more holistic term "sound", I clarify the interdisciplinary and strongly practical oriented character of my work. In a first stage of data collection 20 professional male and female jazz singers are describing the sound of different jazz voices by listening to examples from their own CD collections. The standardized representation format TEI is used to model the transcriptions of the interviews and the 200 collected musical excerpts. Besides searching for timbre descriptors and getting the appropriate musical examples and vice versa, the timbre database will enable multidimensional scaling by representing the importance (size) and similarity (proximity) of timbre descriptors in tag clouds. In a second stage of data collection, participants (musicians, non-musicians, classical singers etc) will be asked to describe a selection of musical excerpts. Communicative accuracy (Juslin's 2000 musical adaptation of Brunswik's lens model) will be assessed by asking listeners to choose the intended timbre from a list of the most common descriptors, on the basis only of recordings. Open questions on the emotionality and corporality of the descriptors and on ideals in jazz singing will be asked.

Besides raising awareness on the usage of timbre descriptors in musical practice, this database will

facilitate singers' communication during singing lessons and rehearsals. It will also help researchers to answer questions such as: What is a "black" sound? How do male and female voice sounds differ? Later, acoustical analyses involving long-time average spectrum and spectral flux can be included in the database to deliver another perspective on the vocabulary. Real-time flexible laryngoscopy and laryngeal stroboscopy while singing – if sufficiently non-invasive - will permit exploration of physiological correlates (such as register). Results of these novel empirical approaches may be compared with traditional similarity judgements of word pairs (multidimensional spaces, semantic networks). Existing theory of timbral dimensions (Gray, McAdams) will be expanded to include corporality (corporality ratings of timbre descriptors; corporality-based categories). Jazz singing professors and students at KUG will be included in both planning and execution at all stages. They will be informed of emerging findings and asked what kind of research would best support them in their daily practice, performance and teaching. Interviews and discussions will be transcribed and analysed, and singers will be included as co-authors in conference presentations and publications.

Modelling flow in piano performance

Manuela M. Marin & Joydeep Bhattacharya

Professional musicians spend many months on practicing a musical piece, aiming at mastering its technical and interpretative challenges in order to prepare for a perfect performance in front of an audience. One possible explanation for performers' motivation to take on intense musical practice on a daily basis for years is the experience of flow. Being 'in flow' or 'in the zone' can be broadly defined as a psychological state involving the positive experience of being fully engaged in the successful pursuit of an activity. This state is characterized by total concentration on the task at hand, the pursuit of clear goals and unselfconscious action. Self-reports of flow include a transformation of people's perception of time as well as a sense of fulfilment and feelings of intense happiness after a flow experience, referring to the intrinsically rewarding experience that flow brings to the individual. Throughout the flow literature, it is generally claimed that flow is related to peak performances and high achievement whether in sports, musical performance, or compositional creativity.

In this study, flow theory and emotion are discussed in relation to personality and individual differences in musicians. Here, we ask whether there is something inherent in the personality of pianists that can help understand why some pianists experience more flow than others. Based essentially on the arguments that musical emotions play a role in the induction of flow in music performance and the finding that there is a positive relationship between trait emotional intelligence and length of musical training, it can be hypothesized that the ability to deal with (musical) emotions effectively is positively associated with the induction of flow states in piano performance. Specifically, the primary goal of the study is to investigate whether trait emotional intelligence could predict flow experienced in pianists. Another goal is the modelling of high achievement in piano performance as measured by having won at least one piano competition in the past. It was hypothesized that the experience of flow in piano performance predicts success in piano competitions to a larger extent than any other background variable.

We focused on a group of 76 piano performance students and assessed their flow experience in piano

performance as well as their emotional intelligence using standardized tests. Multiple regression analysis revealed that flow experience can be predicted by emotional intelligence, which is in line with models of emotional intelligence that claim that the ability to get into a flow state is a sign of high emotional intelligence. Other background variables (gender, age, duration of musical training and amount of practice) were not predictive. The regression model only explained around 23% of the variance of the flow scores. Thus, it can be argued that it needs to be extended and improved by investigating other predictors, preferably those related to pianists' personality.

In order to predict high achievement in piano performance, a five-predictor logistic model was used to fit the data, indicating that the odds to win a prize in a piano competition increased significantly with the amount of practice, as found in earlier reports. Importantly, a positive relationship between flow and high achievement could not be supported. A dissociation between flow and high achievement has been previously reported in sports, suggesting that superior performance in any activity is a multifaceted phenomenon that is conceptually complex and difficult to model.

Perceiving Individuality in Musical Performance: Recognizing harpsichordists playing different pieces

Réka Koren & Bruno Gingras

Studies have shown that uniqueness and individuality can be conveyed through many dimensions of human activity, including not only the visual domain but also the auditory realm. In music performance, expressive devices are the basic building blocks of a performer's artistic individuality, through which they can communicate their personal interpretations of the music. Earlier studies have indicated that learning ensembles were able to classify musical performers playing two different musical pieces. It has also been shown that humans are able to distinguish between unfamiliar performers playing expressive and inexpressive performances of the same piece. Based on these results, the question emerges whether listeners can also distinguish between unfamiliar performers playing two different pieces.

The present study sought to answer this question empirically by asking listeners to group together performances of two different pieces that were played by the same performer, with each performer providing two recordings of each piece. This design allowed us to investigate whether there are differences in the categorisation accuracy when sorting recordings from the same piece or from two different pieces, as well as to analyze the effects of the performer's level of expertise and listener's musical background and gender on categorisation accuracy.

Two recordings of two different Baroque pieces played by six performers (three prize-winners and three non-prize-winners) were used in the experiment. The recordings were played on a harpsichord equipped with a MIDI console. Since this instrument allows only limited timbral and dynamic differentiation, listeners are reduced to relying on timing and articulation. Twenty musicians and twenty non-musicians completed the experiment, which was carried out using an interface written in MATLAB. Participants had to listen to the twenty-four musical excerpts and decide which ones they thought were played by the same performer, and group them together.

Thirty-nine participants performed better than chance on the task, including twenty-six who performed

significantly better than chance. While musicians performed better than non-musicians, the performers' musical expertise did not have a significant effect on grouping accuracy or on the amount of time participants listened to the excerpts. We found a significant difference in the grouping accuracy between the two pieces; moreover, the grouping of the excerpts was easier within-piece than between pieces.

By showing that listeners were able to recognize individual characteristics in musical excerpts from two different pieces played by unfamiliar performers, the study yielded some promising insights into a domain of identity perception which has yet to be fully understood. Furthermore, it points out the role of the musical features of the piece in modulating the extent to which performers' individual features are effectively conveyed.

Emotion regulation and physiological responses to musical mood induction

Changiz Mohiyeddini & Golazin Memar Ardestani

Previous research has revealed that musical mood induction is related to physiological responses. However, the impact of emotion regulation strategies has been neglected. Therefore, it was hypothesized that happy music, in contrast to sad or sedative music, will be associated with increased physiological reactivity and 2) hedonistic emotion regulation (which reflects the ability to intensify or maintain positive emotional states and mood repair) will moderate the relation between positive musical mood inductions and cardiovascular and respiratory responses to music. 34 adults (8 males and 25 females) participated in the study (mean age = 25.5 years, SD = 8.2). Hedonistic emotion regulation was measured using Emotion Regulation Inventory (Mohiyeddini, 2005). Participants were presented a sad, sedative and a happy piece of music (each 3 minutes) while skin conductance responses (SCR), cardiovascular and respiratory patterns (inspiration length, expiration length and total breath length) were recorded. The presentation of musical stimuli was counterbalanced. Results: Main effect of musical mood induction was significant: In contrast to sad or sedative music participants showed shorter expiration and respiratory cycle during happy music. Furthermore, this relation was more pronounced for participants high in hedonistic emotion regulation. Conclusion: Individual tendencies towards certain strategies of emotion regulation should be considered in order to understand the physiological responses to music.

LOCAL RESEARCH GROUPS

Institute of Ethnomusicology

Ethnomusicology is the scholarly study of musics from all over the world. Subject of ethnomusicological research are tradition and modernity of the world's musical cultures. On the basis of in-depth field work on the spot, regional studies are combined with a cross-cultural comparative perspective. Both musical practices and their social contexts are explored. Of particular interest are emic concepts related to music, i.e. both explicit and implicit musical knowledge in the respective cultures.

MusicMediaPublishing

We are a team which consists out of young scientists at the department of musicology. The theoretical concept is based on the term “media”, understood as something that is “in-between”. Main ideas of music/media/publishing are a) to organise informal talks and discussions to connect students/young scientists and b) to give young scientists the opportunity to publish results of innovative research. “All You Need Is Image?!” – the first publication – presents articles of young musicologists from Germany, Switzerland and Austria about images understood as social norms, the role of media in communicating images in present and past, and about interactions of sound and image in notation and arts in the 20th century.

Institute for Composition, Music Theory, Music History and Conducting

Special emphasis is put not only on artistic training and development and unfolding of the arts but also on scientific training and research. “Composition” offers a complex variety of studies including the fields of “Composition”, “Composition-Music Drama” and “Composition-Computer Music”. “Conducting”, too, comprises a wide range of disciplines (“Orchestra Conducting”, “Choir Conducting”, “Repetiteuring”) in which students are prepared for their artistic careers by offering them various possibilities to appear in public. “Theory of Music” focuses on methodological discussion, theory, aesthetic research and analysis of music of the period between the 18th and the 21st century. “History of Music” is a scientific discipline which takes into consideration the complete field of musico-historical development from the ancient to present day's world (with special emphasis on the period between the 18th and the 20th century).

Centre for Systematic Musicology

The Centre for Systematic Musicology promotes research and teaching in all areas of systematic musicology, focusing on music psychology. The centre also promotes interdisciplinary interactions among systematic musicology, its “parent disciplines” (e.g. psychology), and other musical disciplines (e.g. ethnomusicology). The centre contributes to international research in systematic musicology through publications, the creation and maintenance of infrastructures, and the promotion of synergetic collaborations among humanities, sciences and musical practice.

Institute of Electronic Music and Acoustics (IEM)

The Institute of Electronic Music and Acoustics, part of the University of Music and Performing Arts Graz, is located at the campus of the Graz University of Technology. This is not by accident it is an explicit indication for the contextualisation to be an interface between art, technology and research. Algorithmic Composition, Music Information Retrieval, Sonification by the usage of Sound Design and Psychoacoustic relations, Embodied Music Generation and Integration of Spatial Sound properties in the considerations of compositions are identified scopes of our research activities that belong to the field of systematic music research.

Pop / Music + Media / Arts

We do empirical studies in (media)culture in two main areas: a) pop/music and mass media and b) pop/music and media arts and is located at the department of musicology. The theoretical background of these studies considers music being a phenomenon of mediatization. This goes together with the anthropological point of view that music is the cultural transformation of emotional expression – the sound and behaviour of the (excited) body. The area “pop/music and mass media” focuses on the operating system of mass media and its technological conditions in production, distribution and reception. The main theory is that technologically produced sound presents emotion and stimulates cultural behaviour. The area of “pop/music and media arts” considers music as a role model for media arts: digitization and dynamization are main paradigms for technological extended virtualities; musical behaviour, instrumentation of emotional expression is the paradigm of interfaces. These theories and studies are the basis of the masterprogram pop/music and media culture.

AMseL, Institute for Psychology

It has been repeatedly reported that playing a musical instrument has positive effects on perceptual and motor skills and on brain functions. The research project AMseL, supported by the German BMBF, is a collaboration of the Neurological University Clinic of Heidelberg and the Institute of Psychology at the University of Graz. The study addresses the question in what domains primary school children, who participate in the German music education program JeKi (“An Instrument to every child”; <http://www.jedemkind.de/>), benefit from regular instrumental training at school.

Institute for Aesthetics of Music

The aesthetics of music engages with ideas and concepts that are fundamental to music. True to the original word meaning, it unfolds such ideas and concepts in their interplay with perception – ‘aisthesis’. What we take for granted in musical practice, in musicology and in everyday life, aesthetics turns into matter for reflection. Some of the ideas and concepts in case are peculiar to music, others it shares with further areas of thought and action, as, for instance, the idea of a work, of expression, or of form. Yet with regard to music, such more general concepts and ideas take on peculiar meaning to be articulated by aesthetics. Such meaning is not timeless. The history of concepts and ideas shapes our aesthetic access to music.

MUSIC PERFORMANCES

Erica Bisesi: A selection of Chopin Préludes op.28

Erica Bisesi born in Gorizia (Italy), received her first musical education at the age of five. She completed a Bc. L. Degree in Piano Performance at Trieste Conservatorium in 1996. Then she further enhanced her piano techniques and repertoire by attending courses with Bruno Canino in Milano (Accademia Marziali), Firenze (Amici della Musica) and Switzerland (Ernen Musikdorf), the conductor Francesco Mander, Aquiles Delle Vigne in Salzburg (Internationale Sommerakademie Mozarteum), Firenze and Rome (Musici Artis), Anna Kravtchenko, and Vladimir Krpan in Zagreb (Superior Music Academy). She is performing professionally as soloist and in chamber music ensembles in Italy and other countries.

Erica has always shown interest in artistic activity and scientific studies and research. Therefore, she completed a Ph. D. Degree in Mathematics and Physics at Udine University in 2007 and has participated in many conferences and given seminars in Austria, Cyprus, Croatia, Germany, India, Italy, Slovenia, Spain, Sweden, Switzerland and USA. Her research interests comprise expressive piano performance, physics of musical instruments, psychology of music, psychophysics and computational psychoacoustics.

La marimba graZiosa

La marimba graZiosa started as a students’ practice group to gain insights into the Mexican marimba tradition through practical training. Soon there grew an affinity to the instrument and its culture. A trip to Chiapas/Mexico in February 2010 including lessons with Mexican marimba teachers finally motivated the graZiosas to found a *real* marimba (the term is used both for the instrument and the band). Their repertoire ranges from traditional and contemporary Mexican and Guatemalan pieces to interpretations of traditional Austrian music.

POSTER PRESENTATIONS

Relaxing Effects of Music

Markus Becksteiner, Johannes Rath

Emotions are happier in music than in everyday life

Lukas Dullnig, Thomas Messerschmidt, Patrick Zündel

Music in pain management

Christoph Franz, Bernd Hoffberger, René Steiner

Why are we listening? Mood management via music

Florian Gruber, Peter Zotter

Musical instrument preferences of children

Lukas Juwan, Nina Šala, Titika Politis

Popular music in advertising

Philipp Prückl, Veronika Muchitsch

Sadness and happiness in speech and music

Sara Papst, Michaela Neuhold

Music and autobiographical memories

Alexandra Pester, Lena Zechner

Personality and music preferences: Extraversion and arousal

Nadine Scharfetter and Jochen Mosbacher

Physiological responses to music

Monika Voithofer, Martina Preiner

NOTES

NOTES